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# ANNUAL REPORT

OF THE

# CANAL COMMISSIONERS

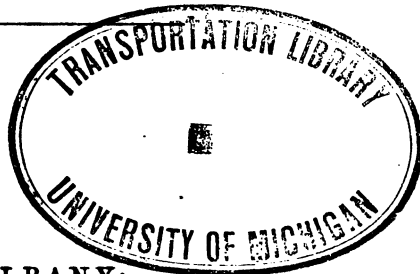
OF THE

STATE OF NEW YORK.

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TRANSMITTED TO THE LEGISLATURE JANUARY 6, 1874.

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ALBANY:

WEED, PARSONS AND COMPANY, PRINTERS.

1874.

TC  
624  
N7  
A3  
1872/73

STATE OF NEW YORK.

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No. 6.

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IN ASSEMBLY,

January 6, 1874.

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ANNUAL REPORT OF THE CANAL COMMISSIONERS.

STATE OF NEW YORK:

CANAL COMMISSIONERS' OFFICE,  
ALBANY, December 31, 1873. }

*To the Honorable the Legislature of the State of New York:*

The undersigned herewith transmit their respective reports as Canal Commissioners, for the fiscal year ending the 30th day of September, 1873.

Very respectfully,

JOHN D. FAY,  
ALEXANDER BARKLEY,  
R. W. STROUD,  
*Canal Commissioners.*

TC.

624

N7

A3

1872/73

# ANNUAL REPORT.

## STATE OF NEW YORK:

CANAL COMMISSIONERS' OFFICE,  
ALBANY, December 31, 1873. }

*To the Honorable the Legislature of the State of New York:*

The Canal Commissioners, in charge of the canals of this state, respectfully submit their

## ANNUAL REPORT

for the fiscal year ending September 30, 1873.

The Board of Canal Commissioners, on the first day of January, 1873, consisted of John D. Fay, Alexander Barkley, and R. W. Stroud.

It was organized by the election of John D. Fay, President, and R. W. Stroud, Secretary.

To Alexander Barkley was assigned, in special charge, the Eastern Division of the canals, which is made up as follows:

### ERIE CANAL, EASTERN DIVISION.

	Miles.	
Albany to East bank of Oneida Lake canal.....	133.58	
Albany basin (1 mile for tolls, Laws of 1849).....	.77	
Port Schuyler and West Troy side-cuts .....	.35	
		134.70
Champlain canal and Waterford side-cut.....	66.00	
Pond above Troy dam .....	3.00	
Glens Falls feeder and pond above .....	12.00	
		81.00
Black River canal.....	35.33	
Black River feeder and pond above dam .....	12.09	
Delta feeder .....	1.38	
Black River improvement.....	42.50	
		91.30
Total.....		307.00





# ANNUAL REPORT.

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	<hr/>	134.70
Champlain canal and Waterford side-cut.....	66.00	
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Glens Falls feeder and pond above .....	12.00	
	<hr/>	81.00
Black River canal.....	35.33	
Black River feeder and pond above dam .....	12.09	
Delta feeder .....	1.38	
Black River improvement.....	42.50	
	<hr/>	91.30
	<hr/>	
Total.....		307.00
		<hr/>

To R. W. Stroud was assigned, in special charge, the middle division of the canals, which embraces the following :

	Miles.
Erie canal, from the East bank of the Oneida Lake canal to the county line between Seneca and Wayne counties, including the several feeders and reservoirs.....	76
Chenango canal, feeders and reservoirs.....	97
Chenango canal extension, now under contract for construction,	30
Oswego canal.....	38
Oneida Lake canal.....	7
Oneida River improvement.....	20
Seneca River towing-path.....	5½
Cayuga and Seneca canal.....	23
Cayuga inlet.....	2
Crooked Lake canal.....	8
Chemung canal.....	23
Chemung canal feeder.....	16
Seneca River improvement.....	12½
Total.....	<u>358</u>

To John D. Fay was assigned, in special charge, the western division of canals.

The canals embraced in this division are as follows:

	Miles.
Erie canal, from the east line of Wayne county to Buffalo, including works connected therewith.....	149
Genesee Valley canal from Rochester to Olean.....	107
Extension of said canal from Olean to Mill Grove.....	6
Dansville branch, from Shakers to Dansville.....	11
Total.....	<u>273</u>

#### SUMMARY.

	Miles.
Eastern Division.....	307
Middle Division.....	358
Western Division.....	273
Total.....	<u>938</u>

JOHN D. FAY,  
ALEXANDER BARKLEY,  
R. W. STROUD,  
*Canal Commissioners.*

## EASTERN DIVISION.

### REPORT OF ALEXANDER BARKLEY, CANAL COMMISSIONER.

The commissioner in charge of the eastern division of the New York state canals respectfully presents his annual report for the fiscal year ending on the 30th of September, 1873.

The eastern division comprises that portion of the Erie canal extending from the south end of the Albany basin to the east bank of the Oneida Lake canal at Higginsville, nine miles west of Rome, including also the Champlain canal, extending from Troy to Whitehall, and the Black River canal and improvement, extending from Rome to Carthage, together with all feeders, dams, side-cuts and reservoirs connected therewith, its aggregate length being three hundred and seven miles. This division is divided into eleven superintendent or repair sections; the Erie canal into five, and the Champlain and Black River canals each into three.

The following named superintendents of repairs were placed in charge of these sections by appointment of the canal board in the month of February, 1873:

Section one, Erie canal .....	Norris North.
Section two, Erie canal .....	Hiram Parker.
Section three, Erie canal .....	Samuel Donaldson.
Section four, Erie canal .....	Wm. M. Dorr.
Section five, Erie canal .....	Henry S. Stark.
Section one, Champlain canal .....	F. K. Marshall.
Section two, Champlain canal .....	I. E. Locke.
Section three, Champlain canal .....	E. W. Harrigan.
Section one, Black River canal .....	S. M. Ferguson.
Section two, Black River canal .....	C. Ray.
Section three, Black River canal .....	J. H. Root.

By appointment of the board of canal commissioners James J. Barkley has acted as division agent, or general superintendent on this division, and Hon. Nelson J. Beach as general agent on the Black River canal and reservoirs during the fiscal year.

The engineering department of this division has been under the charge of William B. Cooper, division engineer, and Walter W. Jerome, resident engineer, during the fiscal year.

The following is a detailed statement of the objects and amounts of all the expenditures on this eastern division during the fiscal year; together with a general statement showing the state and condition of the canals comprising the division, and recommendations for their improvement, and such other measures connected with canal navigation as the commissioner in charge deems of public interest and beneficial to the internal commerce of the state.

## ERIE CANAL.

### SECTION NO. 1.

#### *Norris North, Superintendent of Repairs.*

This section extends from the south end of the Albany basin to the west end of the lower Mohawk aqueduct, including the West Troy and Port Schuyler side-cuts; the Champlain canal, from the junction to a point two hundred feet north of the guard-lock at Cohoes, on the south side of the Mohawk river; the Troy dam, sloop-lock and pond above, making a total distance of nineteen miles.

The structures upon this section are:

Forty-four locks; one hundred and eighty lock-gates; two weigh-locks; two collection and weigh offices; one aqueduct (lower Mohawk); six waste-weirs; sixteen culverts; one dam (across Hudson river); fourteen farm bridges (wood); five road bridges (wood); nineteen road bridges (iron); two tow-path bridges (wood); three tow-path bridges (iron); nine lock-houses; twenty-two watch-houses; one work-shop; two timber sheds; one dwelling house at State yard, Cohoes.

The following is a condensed statement of repairs made since October 1, 1872.

### LOCKS.

Extensive repairs and improvements have been made to all the locks on this section from Nos. 1 to 18, inclusive, and West Troy and Port Schuyler side-cuts, including new piers at locks 6 and 7, and new foundations of concrete and timbers at locks 5 and 9, at a cost of \$7,350.07. This does not include the cost of repairing break in foundation of lock 6.

### LOCK-TENDING.

The cost of lock-tending was, \$24,761.68.

## OIL FOR LOCKS.

The cost of lighting the locks during the night time was \$271.81.

## LOCK-GATES.

Twenty-nine new lock-gates have been constructed and inserted at the following locks, viz.: Six at No. 1, two at No. 2, one at No. 3, one at No. 6, four at No. 7, one at No. 8, two at No. 13, two at No. 16, four at No. 17, two at No. 18, two at Port Schuyler side-cut, two at West Troy side-cut. Also extensive repairs, such as new valves and balance beams, have been made to gates at the following locks, from Nos. 1 to 18, inclusive; Port Schuyler and West Troy side-cuts, junction and Cohoes guard-lock, at a total cost of \$15,705.99.

## AQUEDUCTS.

Extensive and thorough repairs have been made to the wood-trunk of the lower Mohawk aqueduct, including protection to the stone-piers of the same, at a cost of \$3,527.34.

## CULVERTS.

Slight repairs have been made to Hinchman's, Van Rensselaer's, Patroon's and West Troy arsenal culverts, at a cost of \$302.65.

## WEIGH-LOCKS.

Slight repairs have been made to the scales at the West Troy and Albany weigh-locks, at a cost of \$230.13.

## BRIDGES.

Four new wood farm bridges have been constructed; one at Lansing's, between locks 17 and 18, with wrought-iron chords and cast-iron shoes, and two stone abutments to same; one at Van Rensselaer's, on six-mile level; one at State yard, Cohoes; and one at Malony's farm between locks 3 and 4.

Extensive repairs have been made to the following also: Lawrence street, Water street, and Albany street, at Albany; Auburn street, Spring street, Broadway street, Union street, Dunlop's, Port Schuyler and Change bridge at West Troy; and slight repairs were made at Troy street, Genesee street, and junction, at West Troy; and Lansing's and Wheeler's, at Cohoes, at a total cost of \$4,723.87.

## STATE SCOWS.

One new scow has been built at a cost of \$400, and repairs made to the old, named *J. J. Barkley*, at a cost of \$47.56, making a total cost of \$447.56.

**DWELLING-HOUSE.**

Slight repairs were made to the dwelling-house at State yard, at a cost of \$11.33.

**ICE-BREAKERS.**

One new ice-breaker has been built at a cost of \$650, and slight repairs made to old at a cost of \$74.30, making a total cost of \$724.30.

**UNDER-WATER EXCAVATORS.**

Slight repairs have been made to the steam dredge, at a cost of \$168.50.

**LOCK-HOUSES.**

Slight repairs have been made to the lock-house at lock 2, at a cost of \$2.50.

**WORK-SHOP.**

For finishing the construction of work-shop at Cohoes, and making extensive additions and improvements rendered necessary to protect the same from fire and decay, the cost was \$4,153.77. Other slight repairs cost \$67.35, making a total cost of \$4,221.12.

**WATCH-HOUSES.**

Two new watch-houses have been built: One at lock 2, one at Cohoes guard lock, at a cost of \$267, and slight repairs made to the houses at locks Nos. 1, 17, and sloop-lock, cost \$84.95. Total cost of this item, \$351.95.

**PLANING MACHINE.**

A new Daniel's planing machine and fixtures have been set up in the state work-shop at Cohoes, for the purpose of decreasing the expense of building lock-gates, at a cost of \$844.91.

**TOW-PATH AND BERME BANK.**

The tow-path has been raised and ballasted on  $\frac{1}{4}$ , 6 and 9 mile levels, and between the sixteen locks, at a cost of \$2,144.03.

**CLEANING OUT PRISM.**

The bottom of canal was well cleaned in the spring, so that at least seven feet of water has been maintained, during the entire season, on all the levels of this section, at a cost of \$1,649.45.

**SUNKEN BOATS.**

Twelve boats have sunk on this section since the opening of navigation; none of them caused a detention to navigation of more than two hours at a time. Assistance was rendered by the state to the amount of \$589, of which \$416.50 was refunded.

## SLOPE AND VERTICAL WALL.

Repairs have been made to the vertical wall on  $\frac{1}{2}$ , 6 and 9 mile levels, and between sixteen locks, at a cost of \$273.85.

## DOCKING.

New timber docking has been put in at railroad bridge, near Waterford, and at Mohawk river near Cohoes guard-lock, at a cost of \$700. And substantial repairs have been made to the docking at different points on the  $\frac{1}{2}$ , 6 and 9 mile levels, and between the sixteen locks, at a cost of \$3,144.34. Making a total cost of \$3,844.34.

## BREACHES.

Two breaks occurred on this section during the past year: One near Hinchman's culvert, on the berme side of canal, on the 19th day of March, 1872, caused by muskrats digging through the bank. It was repaired at a cost of \$130.40.

The other at and under lock 6, caused by the foundation of lock giving away. Navigation was suspended seventy-two hours. The entire lock-bottom was concreted.

The cost was \$2,817.52; making total, for the above item, \$2,947.92.

## BREAKING ICE.

The cost of breaking ice and assisting navigation near its close, in 1872, was \$1,086.09.

## WATCHING CANAL.

Competent watchmen have been employed, day and night, to watch the canal, assist boats, and to prevent crowds, at a cost of \$4,785.11.

## DREDGING.

The removing of sand bars and other obstructions from the Hudson and Mohawk rivers, at Port Schuyler, West Troy, Guard-lock, Cohoes, Sloop-lock, Troy, and Albany basin, was done at a cost of \$2,073.25.

## SNUBBING POSTS.

New snubbing posts have been set at different points through the sixteen locks, at a cost of \$26.65.

## SWING BRIDGES.

The cost of tending swing bridge over slip at West Troy side-cut, was, for the year, \$160.

## UNPAID ACCOUNTS.

There has been paid, the past year, outstanding bills accruing the previous year, the sum of \$701.43.



**MISCELLANEOUS.**

Miscellaneous expenses, including office rent, telegraphing, postage, coal, gas, etc., have been incurred and paid, to the amount of \$372.15.

The lock piers through the sixteen locks are in a bad condition, and should be entirely re-built, as, from constant repairs, they have become too short to answer the purpose for which they were intended.

In the original construction of the sixteen locks, it was not thought necessary to concrete the bottoms. A number have since been concreted, and all should be, as many of them leak badly, and there is no other way to make them secure.

Twenty new gates should be constructed during the coming winter, and inserted before the opening in the spring.

The rods, valves and levers of the old gates will require to be overhauled and repaired, and many of them should be replaced by new ones, as they are nearly worn out.

Two farm bridges should be built during the coming year. I would recommend that they be constructed of wood, with wrought iron chords, and cast shoes. They are less expensive than iron, and will, when well constructed (if the truss is kept painted), last fifteen or twenty years, by renewing the floor timbers and planking when worn out.

Much work remains to be done on the tow-path, particularly around all the locks, from three to eighteen, inclusive.

Vertical wall should take the place of the docking on the berme side, through West Troy.

## I. ORDINARY REPAIRS.

1. *Superintendent's Expenditures for Repairs.*

STRUCTURES OR WORKS, ETC.	Cost of New Structures.	Cost of Repairs to old Structures.	Total.
Locks. ....	\$2,472 00	\$4,878 07	\$7,350 07
Lock tending. ....		24,761 68	24,761 68
Oil for locks. ....		271 81	271 81
Lock gates. ....	12,404 67	3,301 32	15,705 99
Aqueducts. ....	1,000 00	2,527 34	3,527 34
Culverts. ....		302 65	302 65
Weigh locks. ....		230 13	230 13
Bridges of all kinds. ....	2,093 70	2,630 17	4,723 87
State scows. ....	400 00	47 56	447 56
Dwelling-house. ....		11 33	11 33
Ice-breakers. ....	650 00	74 30	724 30
Under-water excavators. ....		168 50	168 50
Lock-houses. ....		2 50	2 50
Work-shop. ....	4,153 77	67 35	4,221 12
Watch-houses. ....	267 00	84 95	351 95
Planing machine. ....	844 91		844 91
Tow-path and berme bank. ....		2,144 03	2,144 03
Cleaning out prism. ....		1,649 45	1,649 45
Sunken boats. ....		589 00	589 00
Slope and vertical wall. ....		273 85	273 85
Docking. ....	700 00	3,144 34	3,844 34
Breaches. ....		2,947 92	2,947 92
Breaking ice and assisting boats. ..		1,086 09	1,086 09
Watching canal. ....		4,785 11	4,785 11
Dredging. ....		2,073 25	2,073 25
Snubbing posts. ....	26 65		26 65
Swing bridges. ....		160 00	160 00
Unpaid account. ....		701 43	701 43
Miscellaneous. ....		372 15	372 15
	<u>\$25,012 70</u>	<u>\$59,286 28</u>	<u>\$84,298 98</u>
Clerk hire. ....			900 00
Superintendent's salary. ....			1,500 00
			<u>\$86,698 98</u>

2. *Drafts on Auditor.*

Commissioner's salary.....	\$2,000 00
Engineering chargeable to ordinary repairs, eastern division.....	11,770 00
Dredging Albany Basin.....	4,658 00

3. *Miscellaneous Expenditures by Commissioner.*

Salaries, printing, postage, stationery, express, telegrams, Commissioners' office, and general miscellaneous expenses for the eastern division during the fiscal year .....	8,066 82
Commissioner's mileage, as provided by law .....	700 00

## II. EXTRAORDINARY REPAIRS.

1. *Drafts on Auditor.*

Rebuilding lock No. 2 (completed and final account settled).....	9,680 67
Lower lock, upper side cut, West Troy .....	14,008 00
Upper lock at upper side cut, West Troy.....	32,674 00
Canal street bridge at West Troy (completed and final account settled) .....	10,949 84
Change bridge at West Troy .....	3,417 00
Removing wall-bench from Port Schuyler to lower Mohawk aqueduct .....	75,684 00
Swing bridge, upper side cut, West Troy (completed and final account settled) .....	1,990 03
Iron sidewalk bridge at Cohoes .....	2,023 00

2. *Miscellaneous.*

Printing, advertising, and publishing notice to contractors, chargeable to eastern division of the Erie canal, from Oct. 1, 1872, to Sept. 30, 1873.....	925 00
Engineering, for work on the eastern division of the Erie canal, from Oct. 1, 1872, to Sept. 30, 1873...	17,484 00
Constructing approaches on the west side of White street bridge, Cohoes.....	210 00
Constructing state shop at Cohoes.....	4,998 23
Rebuilding Troy dam.....	41,527 19

## III. AWARDS OF CANAL APPRAISERS.

Certificates for awards.....	18,182 00
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## SECTION No. 2.

HIRAM PARKER, SUPERINTENDENT.

Section No. 2, Erie canal, extends from west end of lower Mohawk aqueduct to head of lock No. 27, a distance of 32 miles.

The structures on this section are: Eighteen locks, one guard-lock, seventy-four lock-gates, three aqueducts, two waste-weirs, nineteen culverts, twenty-two road bridges (wood), three road bridges (iron), eighteen farm bridges (wood), two change bridges (wood), one tow-path bridge (wood), one draw bridge (wood), seven lock-houses, one workshop and timber-shed, nine watch-houses, and one dam across Mohawk river at upper Mohawk aqueduct.

The locks Nos. 19, 20, 21, 22, 23, 24, 25, 26 and 27 have been repaired by putting four new miter sills in Nos. 23, 24, 26 and 27; bumping-beams in Nos. 21, 24, 25 and 27; new timbers on piers, setting snubbing-posts, repairing bottoms, and four new bottoms in locks Nos. 20 and 25, at an expense of \$3,634.71.

Competent men have been employed on all the locks, at a cost of \$9,798.48.

Seven new lock-gates have been inserted at locks Nos. 19, 20, 21, 22 and 27; eighteen valves inserted, five new balance beams used, and five gates framed and on hand ready for use, at a cost of \$6,368.40.

The upper Mohawk aqueduct has been repaired by putting in new braces where needed, and the foot bridge repaired. The aqueducts at Hoffman's Ferry and Van Slyck have also been repaired, costing \$1,014.82.

Eighteen dollars and twenty-four cents have been expended in repairing waste-weirs on seven-mile level, and \$18.75 in cleaning and opening culverts.

## BRIDGES.

Two new road bridges have been built, one at Front street, Schenectady, and one at Becker's, on four-mile level; eighteen farm bridges, twenty road bridges, and the change bridge have been repaired, most of the approaches raised and graveled, new braces, floor timbers and needle-beams have been put in others, and all more or less planked, costing \$6,867.14.

## STATE SCOWS.

Repairs have been made to the scows, new iron shoes having been put on one, which, including dry-dock bills and painting, cost \$217.32.

The ice-breakers, which were in a very bad and decayed state, were overhauled and repaired in the fall, but it was necessary to have one docked in order to keep it up, making an expense of \$148.23.

#### TOW-PATH.

Repairs have been made to the towing-path and berme banks by raising and strengthening the same by rip-rap wall on back of banks, and sheet piling in many places, to prevent breaks and stop leaks, making a cost of \$3,296.29.

There was expended in cleaning the bottom of canal during the spring the sum of \$628.45, and \$314.20 expended removing gravel, etc., from under Hoffman's Ferry aqueduct, to allow the passage of water and prevent damage.

A vertical wall has been built between locks Nos. 21 and 22, at Rexford Flats, to facilitate the passing of boats, costing \$507.10.

#### DOCKING.

Repairs have been made to docking on nine, seven, four and seven-mile levels, at an expense of \$485.40.

The cost of breaking ice, and assisting boats in consequence of ice, has been \$1,438.24.

#### WATCHING CANAL.

Competent men have been employed, whenever necessary, to watch the banks both night and day, at a cost of \$1,260.60.

Three hundred sixty-four dollars and fifty-nine cents have been expended for rent of office, shop and dock, telegrams, gas, coal, postage, etc.

One thousand thirteen dollars and twenty-five cents have been expended for foremen and labor assisting navigation on western end of section.

At least seven feet of water has been maintained on each and every level on this section, during the season of navigation; and no detentions have occurred, except about 22 hours (Sept. 8th) which was caused by the bottom of lock No. 25 giving out, and was at the time re-planked.

There should be new gates built and put in at the guard lock the coming winter, as they are unsafe, and it was with great difficulty they were kept in last spring, during the high water.

Twelve new gates should be inserted, and the lock-bottoms thoroughly repaired; the creeks at Hoffman's Ferry and Van Slyck's cleaned so as to allow room for the water to pass under and prevent

damage. New road bridges should be built at Van Slyck's and Crawford's, on four-mile level, and two in the city of Schenectady, at Church and Jefferson streets; farm bridges at McDermott's, Mabee's, Veeder's, Turnbull's, Clut's, and the change bridge at Rexford Flats. New caps should be put on the upper Mohawk aqueduct during the winter, and a new foot bridge built.

There remains on this section a portion of old wall bench, which should be removed to give additional width to prism.

The annexed table will show the cost of all the work of ordinary repairs done for the fiscal year commencing Oct. 1, 1872.

#### I. ORDINARY REPAIRS.

##### 1. Superintendent's Expenditures for Repairs.

STRUCTURES OR WORK.	Cost of New Structures.	Cost of Repairs to Old Structures.	Total.
Locks.....	\$1,909 64	\$1,725 07	\$3,634 71
Lock-tending .....		9,798 48	9,798 48
Lock-gates.....	3,834 48	2,533 92	6,368 40
Aqueducts.....	845 80	169 02	1,014 82
Waste-weirs.....		18 24	18 24
Culverts.....		18 75	18 75
Bridges of all kinds.....	3,771 06	3,096 08	6,867 14
State scows.....	195 28	22 04	217 32
Ice-breakers.....		148 23	148 23
Repairing and raising tow-path and berme bank.....		3,296 29	3,296 29
Cleaning bottom of canal.....		628 45	628 45
Cleaning out creeks.....		314 20	314 20
Slope and vertical wall.....	140 00	367 10	507 10
Docking.....	230 00	255 40	485 40
Breaking ice and assisting boats in consequence of ice.....		1,438 24	1,438 24
Watching canal.....		1,260 60	1,260 60
Assisting navigation.....		1,013 25	1,013 25
Other miscellaneous expenses.....		364 59	364 59
	\$10,926 26	\$26,467 95	\$37,394 21
Superintendent's salary.....			1,500 00
Clerk hire.....			900 00
			\$39,794 21

## II. EXTRAORDINARY REPAIRS.

1. *Drafts on Auditor.*

Removing wall-bench from lower Mohawk aqueduct to lock No. 20.....	\$561 00
Wood bridge, with iron chords, at Crescent (completed and final account settled) .....	1,471 09

2. *Miscellaneous Expenditure.*

Land damages, settled by commissioner .....	800 00
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## III. AWARDS OF CANAL APPRAISERS.

Certificates issued for awards during the fiscal year...	26,407 24
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## SECTION No. 3.

## SAMUEL DONALDSON, SUPERINTENDENT.

Section No. 3, Erie canal, extends from the head of lock No. 27, "three miles east of Port Jackson," west to the foot of lock No. 34, a distance of 37 miles; also Rocky Rift feeder, which is four miles in length.

The structures on this section are as follows: Twelve lift-locks, one guard-lock, fifty-four lock-gates, seven aqueducts, twenty-nine culverts, three waste-weirs, thirty-one farm bridges (wood), fifteen road bridges (wood), eight road bridges (iron), one suspension foot bridge at Fort Plain, three lock-houses, two workshops, six watch-houses, two dams and one collector's office.

## NEW STRUCTURES.

The bottoms and culverts of locks Nos. 31 and 33 have been concreted and re-planked, and two new miter-sills inserted in locks Nos. 30 and 32, all at a cost of \$1,150.

## REPAIRS.

Locks No. 28, to and including No. 33, have been repaired by putting new timbers in bulk-heads, piers, etc., at an expense of \$371.89.

## LOCK TENDING.

Competent men have been kept on all the locks on this section during the past season, at a cost of \$6,366.41.

## LOCK GATES.

One pair new gates have been inserted, in lock No. 30, and 15 new valves in locks Nos. 28, 29, 30, 32 and 33, and timber pur-

chased and framed for one pair gates, at a cost of \$1,647.68; \$958.56 has been expended repairing lock gates.

#### AQUEDUCTS.

The trunk of Schoharie creek aqueduct has been built new complete, which, including the removal of the old structure during the winter, cost \$44,070.12. New bents have been put in Canajoharie aqueduct, and tow-path bridge rebuilt new, at an expense of \$1,615.48. Two new stone piers and the road creek bridge have been rebuilt at Lasher's aqueduct, at a cost of \$873.39; they were carried away by a boat striking the side of the aqueduct, May 23d, 1873. Repairs have been made to Printup's, Yatesville, Lasher's, Spraker's, Canajoharie and Fort Plain aqueducts, all at a cost of \$2,786.79. The above aqueducts have to be taken up and replaced each year, increasing the expense of same.

#### WASTE-WEIRS.

A new stone waste-weir has been built at Port Jackson, on five-mile level, at a cost of \$2,097.87.

#### CULVERTS.

Repairs have been made to Sparks', on six-mile level, and culverts on six and five-mile levels have been cleaned, all at an expense of \$613.95.

#### BRIDGES.

A new road bridge has been erected at Spraker's Basin, and the abutments and approaches raised. Two new farm bridges on 14 mile level, at Starin's and Printup's, one new farm bridge at A. J. Wagner's on six mile level and the wood work of iron road bridges at Port Jackson and Fort Plain, have both been rebuilt. Also six new bridges have been painted and two bridges rebuilt on Rocky Rift feeder; all at a cost of \$3,472.38.

*Repairs* have been made to bridges at Port Jackson, Ender's, Fort Hunter, Hudson's, Putman's, Harisville, Burm's, Swanker's, Koon's, Poor-House, Vrooman's, Sand Hill, Fultonville, Snyder's, Downing's, Yates', Lasher's, Mitchel's, Spraker's, Craig's, Van Alstine's, Smith's, Canajoharie, Fort Plain, Bellinger's, and all feeder bridges; all at an expense of \$2,490.43.

#### STATE SCOWS.

Lumber on hand for new scow, \$292.23. Repairs to scows, including dry-dock bills, etc., \$94.48.



## ICE BREAKERS.

Repairs have been made to breakers to the amount of \$27.74.

## LOCK HOUSES.

The house on lock No. 29 has been overhauled and rebuilt, and also repairs made to house on lock No. 33, at a cost of \$355.65.

## TOW-PATH.

On the five, two, fourteen, six and three-mile levels the towing-path has been raised and repaired, which, including repairs to leaks, cutting weeds, etc., cost \$3,688.18.

## PRISM.

The prism of canal on this section was thoroughly cleaned out, also Rocky Rift feeder, after the spring freshet, and the feeder banks replaced and repaired, at a cost of \$1,518.47.

## DITCHES.

The ditches on the fourteen, six and three-mile levels have been opened and cleaned out, at an expense of \$877.35.

## DAMS.

Temporary repairs have been made at Rocky Rift bulk-head, at a cost of \$182.03.

## DOCKING.

Docking on fourteen and six-mile levels has been repaired, at a cost of \$275.90.

## REPAIRS OF BREACHES.

A break occurred in the culvert under the waste-weir at Port Jackson, on five-mile level, May 11, 1873, which was promptly repaired, at a cost of \$1,559.47. Navigation was not delayed, as it was repaired before the time for opening of canal.

## BREAKING ICE.

The canal was closed by us some days before the advertised time for suspension of navigation, and an expense was incurred in breaking ice and assisting boats in consequence of ice, to the amount of \$971.14.

## WATCHING CANAL.

Reliable watchmen have been employed day and night on all the dangerous embankments on this section, at a cost of \$860.61.

The stone carried into the river by breach of July 5, 1872, at Port Jackson, have been taken out and placed on the towing-path, at an expense of \$219.31.

At least seven feet depth of water has been maintained on all the levels of this section, and no delays have occurred to navigation, except the breach at Lasher's aqueduct May 23d, which detained navigation 36 hours.

The bottoms and culvert of lock No. 29 will have to be concreted and re-planked, and new miter-sills and bumping timbers in locks 28, 29, 30, 31 and 33, and piers of locks Nos. 28, 29, 31 and 33 should be rebuilt; six new gates will be required in locks Nos. 28, 29 and 31, and a pair of new gates at head of Schoharie creek feeder, and bulk-head rebuilt at same feeder.

The tow-path bridges at Printups, Yatesville and Lasher's aqueducts are in a very bad condition and should be rebuilt.

Considerable timber will be required for Printup's, Yatesville and Lasher's aqueducts, as the trunks of same will need thorough repairs.

The old wooden waste-weir east of lock No. 31 should be rebuilt with stone during the coming winter, as it is very old and unsafe.

There should be constructed before the opening of navigation at least four new farm bridges, viz.: Burns', Downing's and Abram Yates' on fourteen-mile level, and Smith's on five-mile level; also one road bridge on three-mile level; at least four new bridges should be built on the Rocky Rift feeder.

The abutments of road bridges at Fultonville, and abutment of farm bridge at Yates, on fourteen-mile level, should be taken down and relaid.

Bulk-head at Rocky Rift feeder should be rebuilt, as it is in a very bad condition.

The culverts through which Castle creek feeder passes should be concreted or covered over top; the water has carried off the coping stone on the bottom of the creek, which has caused the culverts to leak.

## I. ORDINARY REPAIRS.

1. *Superintendent's Expenditures for Repairs.*

STRUCTURES OR WORK.	Cost of New Structures.	Cost of Repairs to Old Structures.	Total.
Locks .....	\$1,150 00	\$371 89	\$1,521 89
Lock-tending .....		6,366 41	6,366 41
Lock-gates .....	1,647 68	958 56	2,606 24
Aqueducts .....	46,558 99	2,786 79	49,345 78
Waste-weirs .....	2,097 87		2,097 87
Culverts .....		613 95	613 95
Bridges, abutments and approaches	3,472 38	2,490 43	5,962 81
State scows .....	292 23	94 48	386 71
Ice-breakers .....		27 74	27 74
Lock-houses .....		355 65	355 65
Raising and repairing tow-path and berme bank .....		3,688 18	3,688 18
Cleaning bottom of canal .....		1,518 47	1,518 47
Cleaning out ditches .....		877 35	877 35
Dams .....		182 03	182 03
Docking .....		275 90	275 90
Repairs of breaches .....		1,559 47	1,559 47
Breaking ice, etc. ....		971 14	971 14
Watching canal .....		860 61	860 61
Special foreman .....		800 00	800 00
Removing stone from river to Port Jackson waste-weir .....		219 31	219 31
Other miscellaneous expenditures.		168 48	168 48
	\$55,219 15	\$25,186 84	\$80,405 99
Superintendent's salary .....			1,500 00
Clerk hire .....			900 00
			\$82,805 99

## II. EXTRAORDINARY REPAIRS.

1. *Drafts on Auditor.*

Improving approaches to west bridge at Port Jackson,	\$1,360 00
Removing wall bench, etc., from Canajoharie to Fort Plain (completed and final account settled) .....	15,996 39
Stone abutments for bridge one mile above Spraker's (completed and final account settled) .....	719 90

2. *Miscellaneous Expenditure.*

Constructing state shop at Fultonville .....	3,000 00
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3. <i>Land damages settled by commissioner</i> .....	88 00
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## III. AWARDS OF CANAL APPRAISERS.

Certificates issued for awards during the fiscal year..

\$968 51

## SECTION No. 4.

WILLIAM M. DORE, SUPERINTENDENT.

Section No. 4 extends from foot of lock No. 34, at Mindenville, to head of lock No. 45, at Frankfort, a distance of 22 miles.

The structures on this section are twenty-four lift locks; one guard lock; ninety-eight lock gates; four aqueducts; seven waste-weirs; ten culverts; twenty-four farm bridges (wood); ten road bridges (wood); three road bridges (iron); one tow-path bridge (wood); one swing bridge (wood); one dam; one feeder with bulk-head; two feeders without guard locks; eight lock houses; twelve watch houses; one collector's office; two work-shops.

The annexed table shows the cost of all the work of ordinary repairs done on this section by the superintendent since October 1, 1872.

Considerable repairs have been done to miter-sills and piers to locks. The locks repaired extend from locks 34 to 45 inclusive.

Owing to the large number of locks, the cost of lock tending is a very large item of expense on this section. Four lock tenders have been employed at each lock, and every facility afforded for rapid lockages.

The repairs to lock-gates have been very extensive. The gates repaired extend from lock 34 to 45, inclusive.

The past season there have been built four new lock-gates, and one new gate has been inserted. Twenty-four road and farm bridges have been repaired, the approaches raised and graveled. Two new bridges have been built and put up, as follows: One iron chord wood bridge at Little Falls, on level between locks 39 and 40; one iron chord wood bridge, two-span, at East Frankfort.

One new Carpenter State scow has been built for this section during the year.

The tow-path from locks 34 to 45 has been kept in good repair this season. The large stones have been removed, and many low places filled to prevent swells from the locks and freshets in the spring from running over the same. Considerable rip-rap wall has been built on the level between locks 41 and 42, to prevent the tow-path from breaking away into the river.

Before the opening of navigation in the spring the prism of canal from locks 34 to 45 was well cleaned, the bars were all taken out and the large stones removed.

Three hundred feet of new vertical wall has been built on the berme bank at the foot of lock 42 at Mohawk, and the vertical wall on the feeder at Little Falls extensively repaired.

Repairs have been made to docking at Mindenville, Castle Creek, Little Falls and Frankfort. About 100 feet in length by 8 feet in height of new timber docking has been put in on the east side of Castle creek, and one mile of new docking on level between Finck's Basin and lock 36, raising the towing-path 16 inches, and 300 feet of new docking has been put in on berme bank side at the foot of lock 42 at Mohawk.

Watchmen have been employed to watch the canal nights and days, to assist boats and prevent crowds.

There has been good navigation the entire season on this section. No detention whatever, with the exception of 24 hours caused by a breach in the new culvert at Mohawk, west of lock 43, and four hours caused by the wood bridge at Little Falls falling into the canal.

At least seven feet of water has been maintained in each and every level on this section during the season.

There should be new miter-sills built and put in as follows, viz.: Two in lock 36, one in lock 38, one in lock 40, one in lock 42, and one in lock 43.

New lock-gates should be inserted as follows, viz.: One new gate in lock 35, one in lock 36, one in lock 37, one in lock 38, three in lock 39, two in lock 41, one in lock 42, one in lock 44, and three in lock 45.

There should be three new gates put in Castle creek aqueduct, and one in Fulmer's creek, and one in Steele's creek aqueducts.

New bridges should be built and put up as follows, viz.: One farm bridge at Carter's, on level between locks 39 and 40; one at Stauring's, one at Steele's, on level between locks 40 and 41; one at Myer's, one at London, on level between locks 43 and 44, and one at Burton's, on level between locks 44 and 45.

New iron road bridges should be put up as follows, viz.: One at Mindenville, on level between locks 34 and 35, and one at Frankfort, on level between locks 44 and 45, and one on road from Mohawk to Herkimer.

Lock-house at lock 41 needs considerable repairs, and lock-houses at locks 40 and 44 should be rebuilt.

Watch-houses at locks 34, 35, 36, 38, 40, 41 and 44 require repairs.

A new timber shed should be built at Mohawk.

One hundred and fifty feet in length of docking is required on tow-path side above lock 34; about 1,500 feet along the tow-path, from locks 36 to 39, at Little Falls; also, about 400 feet at Mohawk, on level between locks 41 and 42.

The docking on each side of Castle creek has rotted away, and about 400 feet in length by 8 feet in height should be rebuilt.

#### I. ORDINARY REPAIRS.

##### 1. *Superintendent's Expenditures for Repairs.*

Structures or Work.	Am't Expended.
Locks.....	\$1,686 50
Lock-tending .....	12,891 89
Lock-gates.....	6,706 45
Aqueducts .....	1,030 54
Culverts .....	241 72
Bridges of all kinds, including approaches.....	5,148 75
State scows.....	2,030 44
Ice-breakers .....	88 93
Lock-houses .....	256 93
Watch-houses .....	127 12
Raising and repairing tow-path and berme bank.....	3,749 13
Cleaning bottom of canal.....	918 49
Cleaning out creeks.....	353 04
Slope and vertical wall.....	1,339 59
Dams.....	40 50
Docking .....	2,643 80
Repairs of breaches.....	430 13
Breaking ice, etc.....	794 90
Watching canal .....	620 00
Cutting new ditches .....	518 48
Other miscellaneous expenses .....	148 13
Tools, etc.....	1,610 00
Superintendent's salary.....	1,500 00
Clerk hire.....	900 00
	<hr/>
	<b>\$45,775 46</b>

## II. EXTRAORDINARY REPAIRS.

1. *Drafts on Auditor.*

Removing wall bench from locks 40 to 41 (completed and final account settled).....	\$3,304 07
Removing wall bench from locks 41 to 42 (completed and final account settled).....	8,507 16
Removing wall bench from locks 42 to 43 (completed and final account settled).....	4,470 54
Removing wall bench from locks 43 to 45 (completed and final account settled).....	7,429 00
Changing abutments at German Flats and lengthening culvert under road at East Frankfort.....	5,185 00
Culvert near Mohawk (completed and final account settled).....	3,733 93
Road bridge at Frankfort (completed and final account settled).....	1,450 69
Culvert at Ilion (completed and final account settled),	4,988 90
Bridge at east line German Flats .....	1,717 00

## SECTION No. 5.

## HENRY S. STARK, SUPERINTENDENT.

This section extends from the head of lock No. 45, at Frankfort, N. Y., to the east bank of the Oneida Lake canal at Higginsville, a distance of 34 miles.

The structures upon the section are: One lift-lock (three feet lift), one weigh-lock, four aqueducts, twelve stone-arch culverts and seventeen composite culverts, twenty-four farm bridges (wood), six farm bridges (iron chord), nineteen road bridges (wood), one approach bridge (wood), eighteen road bridges (iron), one tow-path bridge (iron), two two-path bridges (wood), one foot bridge (wood) and two foot bridges (iron), one lock-house, two work-shops, two watch-houses, one bulk-head house, one collector's office, three stop gates with sills, frames and plank complete, two feeder bulk-heads with a total of twelve paddles, three waste-weirs, one stone dam at Mohawk feeder of 180 feet, one dam at Oriskany feeder of 214 feet, and one dam at Wood creek feeder of 32 feet.

The annexed table shows the cost of all the work of ordinary repairs done on this section by the superintendent during the fiscal year.

Some general repairs have been done to lock No. 46, at Utica, one or two new miter sills inserted, jamb timbers replaced at head of lock, etc.

Four new valves have been inserted in the gates of this lock, also two new balance beams, and the gates of this and the weigh-lock otherwise overhauled and repaired. The ordinary repairs of each year will be necessary at these locks another season, including, perhaps, two or three new gates.

The drops, walls, aprons and banks of the Moyer's creek aqueduct in the village of Frankfort, on the nine-mile level, have been repaired throughout, including the cleaning out of the creek channel and sundry repairs to the trunk of the aqueduct. Considerable work has been done by way of repairing the trunks, gates, walls and piers to Ferguson's, Sauquoit creek and Oriskany aqueducts during the season. An entire new trunk is an absolute necessity for the Oriskany aqueduct, and the east end of Sauquoit creek aqueduct will have to be extensively repaired before any dependence can be placed upon its safety, or a notable waste of water be prevented. The floor and a portion of the trunk of Ferguson's aqueduct will need to be repaired. Little, if any, mason work is necessary on any of these aqueducts.

An entire new bulk-head has been placed in Hager's waste-weir at Higginsville, and the obstructions removed from the head of the culvert of the new waste-weir at city mills in the city of Utica. Tafft's and Fort Bull waste-weirs have needed and received very little repairing during the season. The Mohawk feeder, at Rome, has received an entire new, heavy, oak bulk-head, and is now capable of resisting the force of any ordinary spring freshet in the river. The breast-wall of Tafft's waste-weir will need repairing; otherwise the weirs on the section will need very little attention another year.

The usual yearly expenditure has been necessary on the Whittall's creek culvert, on the sixty-mile level; the rebuilding of the old composite trunk of this culvert during next winter cannot be avoided, as it is decayed and injured in such a manner by the spring floods as to become almost useless, and to endanger the banks of the canal. The most reasonable plan for rebuilding it is that of inserting iron tubes in place of the old trunk. Starch factory culvert has been cleaned out and repaired to some extent, as has also the culverts at New London, Whitestown, and on the nine-mile level.

Considerable repairing has been necessary to the beams, cradle and building of the Utica weigh-lock. Various complaints are made by those having charge of this weigh-lock, in regard to its *capacity*,



and a slight settling and disarrangement of the beams rendered it utterly incapable of weighing heavy boats and cargoes for several days during the summer. It was repaired as promptly and efficiently as possible. The out-buildings, culvert, offices and roof have also been repaired to some extent; but the true interests of this canal, and of the state, demand that the old scale (which was enlarged from the one in use before the enlargement of the canal) be replaced by a larger and more modern scale, and the building itself be overhauled and repaired from foundation to roof.

A temporary street bridge, eighteen feet wide, was placed at Hotel street in the city of Utica during the winter, and removed in the spring as usual. Packer's dry-dock, wooden road bridge in the city of Rome, Bridenbecker's (wood road, iron chord), the four-mile grocery (wood road), Kingsley's (wood farm), Mohawk feeder tow-path, and Van Beuran's (wood farm) bridges have been rebuilt. Two of these, viz., Parker's dry-dock and Bridenbecker's, fell down previous to rebuilding. Bradley's iron road bridge has had its wood work entirely replaced, and some sixteen other bridges on the section have been repaired, by replacing needle-beams, repairing approaches, railings and abutments, painting, planking, etc.

Genesee street bridge has been raised and repaired, as provided by chapter 766, laws of 1873, and its approaches regulated to suit its altered elevation, and frame and iron-work of an iron chord bridge, with cast-iron steps, have been made for Green street in the city of Utica.

There will need to be three wooden road bridges and two wooden farm bridges rebuilt, and the wood-work to many of the iron bridges replaced another year.

One new state repair scow has been built by the superintendent for use on the west end of the section, and the two other repair scows have been kept in repair and constant use throughout the season.

A new ice-breaker, for use on the west end of the section, being imperatively necessary, a portion of the material has been purchased, and part of the labor performed toward making a new one, and it will be completed and ready for use this fall.

The under-water excavators, lock-house, bulk-head house, workshops, watch-houses, timber sheds and stop-gates on the section have been kept in complete order with very little expense.

The raising and repairing of tow-path, including setting of snubbing-posts, driving piles, inserting sluices, etc., etc., has been dili-

gently prosecuted throughout the season. The berme bank has had to be strengthened in many places, and the age and wear of many of the bridge approaches, both farm and road, has compelled the use of a large amount of gravel and other material.

The cleaning out of the prism of the canal and feeders, including the removal of deposit at the Rome, Watertown and Ogdensburg railroad lumber and ore docks, during the spring repairs, was done as thoroughly as was possible with the amount of money available for that purpose last spring. But the canal from West Rome to Oriskany, and on the nine-mile level, will need a much more effective cleaning another spring to secure good navigation during the period of low water.

The labor of cleaning out creeks, made-ditches, and channels bordering on and leading under the canal on this section, is of no inconsiderable importance, and they demand constant attention and care, and, however close they may be watched and guarded, require a yearly expenditure of a large amount.

The foundation of the old aqueduct below the Wood creek culvert, at Fort Bull, should be removed, and the channel of the creek cleared to its original capacity, before the spring of 1874, in order to render the drainage complete on valuable lands bordering this creek, south of the canal.

The aprons and abutments to the Oriskany feeder dam have been repaired where rendered necessary by the action of the water and ice during the spring freshets.

The slope walls on the east end of the Mohawk feeder dam, at Rome, will need to be relaid, and the top course of the dam itself backed with gravel, another year. Otherwise the dams on the section are in good condition.

Many feet of the vertical walls on the section fell into the canal, on the sixty-mile level, at Utica and Rome, during the past year, and have been substantially relaid; and the slope walls, being in many places *very old*, have needed and received their share of attention. So long as these slope walls are allowed to remain, and *imperfect* vertical walls accepted from contractors, just so long will they remain the source of yearly expense for *repairs* beyond what might seem necessary to a casual observer.

The docks at New London, Rome and Utica, and many minor points on the section, have been repaired so far as it was possible with the resources at hand. The "sheet-piling dock," at the former place, was partly replaced in the spring by a good timber dock, and important repairs made to other docks, where the safety of the

canals demanded it. Very many of the docks on the section (and especially the timber coping on the tow-path at many points) are in a very bad condition, and will need the *close* attention of the superintendent of repairs for a good while to come.

There have been no breaches on this section of canal during the fiscal year.

An unusual amount of labor in breaking ice, and assisting boats in consequence of ice, and in cutting ice from the arches of aqueducts, throats of culverts and waste-weirs on the section, was made necessary by the unusual severity of the season. Very few loaded boats were retained on the section on account of ice this year, however, and shippers very generally expressed themselves well pleased with the promptness and efficacy of the assistance rendered them.

Navigation on the section has been in nowise impeded by sunken boats, or other casualties of a like nature, during the season; but considerable difficulty and embarrassment has resulted from the unprecedented low state of the water in the river and tributary streams during a large portion of the season; a parallel to which has never before come within the experience of the "oldest inhabitant;" and had it not been for the feeder at Oriskany, and the supply of water from Sand Lake and Woodhull reservoirs, navigation for loaded boats bound east would have been *very seriously* impeded for several weeks; and, as it was, the entire working force of the section had to be employed for several days, in assisting boats aground on account of low water.

The difficulty of obtaining an adequate supply of water for the long level, at the eastern end, is becoming greater each year; and, as it depends almost entirely on those feeders and reservoirs, they should be enlarged and strengthened to meet the demand.

## I. ORDINARY REPAIRS.

1. *Superintendent's Expenditures for Repairs, etc.*

STRUCTURES, WORKS, ETC.	Cost of New Structures.	Cost of repairs to Old Structures.	Total.
Locks .....		\$93 92	\$93 92
Lock-tending .....		1,066 60	1,066 60
Oil for locks.....		8 15	8 15
Lock-gates.....		344 13	344 13
Aqueducts.....		1,240 38	1,240 38
Waste-weirs and feeders .....	\$130 50	237 60	368 10
Culverts .....		913 13	913 13
Weigh-locks.....		252 48	252 48
Bridges, all kinds.....	3,066 49	3,537 67	6,604 16
State repair scows .....	1,275 11	471 44	1,746 55
Ice-breakers.....	136 42		136 42
Under-water excavators .....		44 85	44 85
Work-shops.....		105 69	105 69
Raising and repairing tow-path...		7,967 83	7,967 83
Cleaning out prism of canal .....		3,315 78	3,315 78
Cleaning on creeks .....		806 80	806 80
Dams .....		137 39	137 39
Slope and vertical walls .....		506 30	506 30
Docking .....		1,961 94	1,961 94
Breaking ice.....		678 60	678 60
Watching canal and tending feeder		2,570 80	2,570 80
Wheelbarrows, tools, etc.....		74 95	74 95
Miscellaneous expenditures .....		268 37	268 37
	\$4,608 52	\$26,604 81	\$31,213 33
Superintendent's salary.....			1,500 00
Clerk hire .....			900 00
Total .....			\$33,613 33

## II. EXTRAORDINARY REPAIRS.

1. *Drafts on Auditor.*

Improving Big Basin, Utica (completed and final account settled).....	\$2,873 90
Removing wall-bench, etc., west of Asylum lot, Utica (completed and final account settled) .....	3,016 08
Bridge at Jason street, Utica.....	2,188 00
Removing wall-bench from junction of Chenango canal to city of Utica .....	14,637 00

Iron viaduct over canal at Utica (completed and final account settled) .....	\$3,145 62
Removing wall-bench, etc., at Rome (completed and final account settled).....	1,556 83

2. *Miscellaneous Expenditures.*

Raising Genesee street bridge, Utica .....	2,278 60
Measuring flow of water at Oriskany creek .....	48 00

3. <i>Counsel fees in claim cases, as awarded by the Canal Board</i> .....	1,959 89
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III. AWARDS OF CANAL APPRAISERS.

Certificates for awards.....	<u>\$68,259 21</u>
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CHAMPLAIN CANAL, SECTION 1.

F. K. MARSHALL, SUPERINTENDENT.

This section extends from a point 200 feet north of Cohoes guard lock to foot of first lock north of Saratoga dam, a distance of 28 miles.

The structures upon the section are: Ten locks, one weigh-lock, forty lock-gates, one aqueduct, eleven waste-weirs, seven culverts, forty-two farm bridges (wood), two road bridges (iron), eight tow-path bridges (wood), six lock-houses, seven watch-houses, three store-houses, two workshops, ten foot bridges, one collector and weigh-office, two dams — Saratoga dam, 900 feet long, Cohoes dam, 1,600 feet long.

The following is a statement of the cost of repairs on this section during this fiscal year:

Total cost for lock-tending .....	\$8,091 41
The wooden lock at the Mohawk river has been entirely rebuilt with timber in a substantial manner, which, together with general repairs to the other locks on the section, cost.....	5,735 06
The scales at the Waterford weigh-lock have been thoroughly overhauled and repaired by experienced workmen, and necessary repairs made to the lock and collector's office, at a total cost of.....	1,489 69
Total cost for oil, glass, chimneys and wicks, necessary for lighting the locks on this section .....	153 73

There have been three new lock-gates constructed and inserted in the combined locks at Waterford, which, together with tow-posts, balance beams, and general repairs to the other lock-gates on the section, cost . . .	\$3,242 62
Expended for repairs to the eleven waste-weirs on this section . . . . .	830 87
Expended for repairs to culverts . . . . .	583 13
There has been one new road bridge constructed at Stillwater — one at Bemis Heights and one at Gleason's — and the road bridge at Salisbury's, on sixteen-mile level, remodeled and placed at Stillwater, and general repairs made to all the other bridges on the section, at a cost of . . . . .	5,829 28
Repairs to State scows . . . . .	128 93
Repairs to ice-breakers . . . . .	150 00
Expended for under-water excavating in removing earth from channel in Mohawk river, also from prism of canal near Waterford combined locks, and on two and three and three-quarter-mile levels . . . . .	2,075 09
Expended for repairs to workshops . . . . .	351 03
Total cost for raising, repairing and strengthening tow-path and berme bank on one, two, three and three-quarters, four and sixteen-mile levels; also at Mohawk and Hudson rivers . . . . .	7,761 42
Expended for cleaning prism of canal during spring repairs . . . . .	983 42
Cost of assisting navigation on two and four-mile levels and at Waterford's two locks . . . . .	980 63
Cost of repairs to slope wall . . . . .	254 02
A heavy timber dock has been constructed at the Mohawk river, commencing at a point about 200 feet north of the Cohoes guard-lock, and running north to the Mohawk river bridge, also from the bridge to the Mohawk guard-lock on the Waterford side of the river, and general repairs made to the docking at Hudson river and other places on the section, at a cost of . . . . .	7,526 77
Repairs of breaches . . . . .	234 00
Total cost of breaking ice and assisting boats in consequence of ice . . . . .	631 44
Competent watchmen have been employed to watch the banks, when necessary, at a cost of . . . . .	1,185 00

Expended for monuments to show the location and extent of gravel bed at Schuylerville.....	\$72 00
Expended for steam-tug labor at Mohawk river. ....	495 00
Paid for derrick and guys for use on the section.....	200 00
New snubbing posts have been set at the different locks and on the tow-path and berme banks on the different levels, at a cost of.....	279 00
The spring freshet carried away a portion of the boom at the Hudson river, placed there for the purpose of protecting the canal from float wood, which has been replaced at a cost of.....	385 73
Expended for repairs to canal-boat "John Pennie"....	150 00
Unpaid account, John Lowber, lumber.....	61 17
Unpaid account, Melville Bitely, one month's services..	100 00
Miscellaneous expenses, office rent, telegraphs, stationery and postage.....	146 61
Clerk hire.....	900 00
Superintendent's salary.....	1,500 00
Total expenditures.....	<u>\$52,507 05</u>

There should be an entire new dock constructed at the Hudson river, as the old one is decayed and worthless.

Two new gates should be constructed and inserted at the Waterford combined locks, and new paddles put in the other gates. The gates in the Saratoga guard-lock are old and decayed, and should be replaced before the opening of navigation next spring. The slope wall and docking on the different levels will require some repairs in order to insure good navigation the coming summer, and the prism of the canal should be thoroughly cleaned in the spring, as the passage of the large class boats now navigating this canal demand every inch of water possible to facilitate their progress.

## I. ORDINARY REPAIRS.

1. *Superintendent's Expenditures for Repairs, etc.*

STRUCTURES OR WORK.	Cost of new.	Cost of repairs to old.	Total.
Locks.....	\$5,300 00	\$435 06	\$5,735 06
Lock-tending.....		8,091 41	8,091 41
Weigh-locks.....		1,489 69	1,489 69
Oil for locks.....		153 73	153 73
Lock-gates.....	1,679 00	1,563 62	3,242 62
Waste-weirs.....		830 87	830 87
Culverts.....		583 13	583 13
Bridges of all kinds.....	3,160 00	2,669 28	5,829 28
State scows.....		128 93	128 93
Ice breakers.....		150 00	150 00
Under-water excavating.....		2,075 09	2,075 09
Workshops.....		351 03	351 03
Repairing tow-path and berme bank		7,761 42	7,761 42
Cleaning out prism of canal.....		983 42	983 42
Assisting navigation.....		980 63	980 63
Slope and vertical wall.....		254 02	254 02
Docking.....	4,700 00	2,826 77	7,526 77
Repairs of breaches.....	234 00		234 00
Breaking ice.....		631 44	631 44
Watching canal.....		1,185 00	1,185 00
Monuments.....	72 00		72 00
Unpaid account.....		656 17	656 17
Derrick and guys.....	200 00		200 00
Snubbing posts.....	279 00		279 00
Booms.....	385 73		385 73
Sunken boats.....		150 00	150 00
Office rent, stationery, postage, etc..		146 61	146 61
	\$16,009 73	\$34,097 32	\$50,107 05
Clerk hire.....			900 00
Superintendent's salary.....			1,500 00
			\$52,507 05

2. *Miscellaneous Expenditures.*

Salaries of agents and foremen chargeable to the Champlain canal during the fiscal year.....	\$1,200 00
Constructing, raising and strengthening banks on new work, at two locks above Waterford, and repairing break at that place — (this work is properly chargeable to extraordinary repairs, but was paid from the ordinary repair fund as there was no other fund from which the same could be paid).....	33,233 03
Repairs to State dredge.....	771 98



## II. EXTRAORDINARY REPAIRS.

1. *Drafts on Auditor.*

Engineering, Champlain enlargement.....	\$13,430 00
Stone dam at Fort Miller bridge.....	56,899 00
Enlarging Champlain canal at Bemis Heights.....	15,861 00
Enlarging Champlain canal from guard-lock to Bullard's Bend.....	31,671 00
Enlargement of Champlain canal at Salisbury's.....	21,009 00
Two locks at Three Locks, above Waterford.....	85,595 00
Bridge across Mohawk river, at Cohoes (final account settled).....	49,893 73
Aqueduct at Schuylerville (final account settled).....	52,186 70
Locks 1 and 2, Cohoes (junction locks).....	30,685 00
Enlargement Champlain canal from Schuylerville to Bullard's Bend.....	23,919 00
Farm bridge, iron chords, at station 454½, first division, Champlain enlargement (final account settled).....	3,095 31

2. *Miscellaneous Expenditures.*

Engineering for work done on the entire Champlain canal during the fiscal year (aside from enlargement and ordinary repairs).....	6,036 50
Publishing notice to contractors, etc. (new work let on the Champlain canal).....	822 62
Land damages settled by commissioner.....	1,050 00
3. <i>Counsel fees in claim cases, as awarded by the canal board.</i> .....	150 00

## III. AWARDS OF CANAL APPRAISERS.

Certificates issued for awards.....	\$2,069 59
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## SECTION No. 2, CHAMPLAIN CANAL.

## I. E. LOCKE, SUPERINTENDENT.

This section extends from the foot of Saratoga discharge lock to a point 33 feet south of road bridge at Dunham's Basin, including the Glen's Falls feeder, feeder-dam, and pond above, a distance of 24 miles.

The structures upon the section are: Nineteen locks, sixty-six lock-gates, three aqueducts, six waste-weirs, eighteen farm bridges (wood),

twenty-three road bridges (wood), four road bridges (iron), three tow-path bridges (wood), seven sluice-ways around locks (wood), three lock-houses, two workshops, ten watch-houses, one store-house, one collector's office, one dam (900 feet long) at head of Glen's Falls feeder, nine culverts.

The section was in charge of Sanford Coffin, superintendent, up to February 22, 1873.

General repairs have been made upon the locks: Saratoga discharge, Bassett's, Fort Miller, Fort Edward, and Nos. 1, 2, 3, 4, 5, 6, 7, 8, 10, 11 and 12, Glen's Falls feeder. Locks Nos. 2, 3, 4, 5, 6, 7, 8, 9 and 10 have been raised with timber coping to prevent overflow of water, and seven new miter sills and five culvert frames have been inserted at locks Nos. 4, 5, 7 and 12 Glen's Falls feeder, at a cost of \$2,728.95.

The total cost of lock-tending on the nineteen locks of this section has been \$5,791.21.

Fifteen new lock-gates have been constructed, nine of which have been inserted in locks Nos. 2, 3, 4, 5, 6, 7, 9, 10 and 12 Glen's Falls feeder, and six on hand (four to be inserted at Bassett's and two in feeder locks), costing \$2,594.22.

Necessary repairs have been made to lock-gates on the entire section at a cost of \$1,752.57.

Cost of repairs on Cornell's waste-weir, \$8.61.

There has been one farm bridge constructed at McDonald's, and one foot bridge at Richards', above Whitehall bridge, Glen's Falls feeder, at a cost of \$300.00.

General repairs have been made on the several bridges of the section, including abutments and approaches to same, costing \$2,405.99.

Cost of repairs on State scow, \$49.34.

The tow-path of the section has been raised, widened and strengthened, to guard against breaks and overflow of water. Total cost, \$4,567.45.

The prism of canal on the section has been cleaned out at a cost of \$2,173.65.

Vertical wall has been constructed between Green's, Cornell's, and near Heviland's bridges; also, at Brown's bridge, including excavation of rock and earth for foundation of same, Glen's Falls feeder, costing \$6,252.32.

General repairs to docking have been made on the section, costing \$1,353.66.

Competent watchmen have been employed throughout the season over the high and dangerous embankments, during day and night, to prevent leaks and breaks, at a cost of \$1,068.50.

There has been expended for general foreman labor, regulating water, assisting boats, office rent, postage, freights, lamps and fixtures, the sum of \$962.10.

Clerk hire, 7 4-15 months, \$545.00.

Superintendent's salary, \$908.33.

#### I. ORDINARY REPAIRS.

##### 1. *Superintendent's Expenditures for Repairs, etc.*

STRUCTURES OR WORK.	Cost of new structures.	Cost of old structures.	Total.
Locks.....	\$400 00	\$2,328 95	\$2,728 95
Lock-tending.....		5,791 21	5,791 21
Lock-gates.....	2,594 22	1,752 57	4,346 79
Waste-weirs.....		8 61	8 61
Bridges of all kinds, including abutments and approaches to same..	300 00	2,405 99	2,705 99
State scows.....		49 34	49 34
Raising and repairing tow-path...		4,567 45	4,567 45
Cleaning prism of canal.....		2,173 65	2,173 65
Vertical wall.....	4,262 50	1,989 82	6,252 32
Docking.....		1,353 66	1,353 66
Watching canal.....		1,068 50	1,068 50
Miscellaneous.....		962 10	962 10
	\$7,556 72	\$24,451 85	\$32,008 57
Clerk hire.....			545 00
Superintendent's salary.....			908 33
Total expended by superintendent I. E. Locke .....			\$33,461 90
Expended by superintendent Sanford Coffin during the four months and twenty-one days ending February 22, 1873.....			12,981 43
Total expended by superintendents.....			\$46,443 33

##### 2. *Miscellaneous Expenditures.*

Rents, telegrams, express, stationery and expenses of commissioner's office at Fort Edward..... \$229 25

## II. EXTRAORDINARY REPAIRS.

1. *Drafts on Auditor.*

Champlain enlargement, waste-weir, section 13.....	\$9,673 00
Champlain enlargement, waste-weir, section 20.....	3,400 00
Champlain enlargement, from station 773 to Fort Edward lock (completed and final account settled)....	29,059 81
Vertical wall on Glen's Falls feeder, at Sandy Hill (completed and final account settled) .....	11,804 15

2. *Miscellaneous Expenditures.*

Land damages, settled by commissioners .....	312 40
3. <i>Counsel fees in claim cases, as awarded by the canal board</i> .....	608 30

## III. AWARDS OF CANAL APPRAISERS.

Certificates issued for awards.....	\$9,167 62
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## SECTION No. 3, CHAMPLAIN CANAL.

## E. W. HARRIGAN, SUPERINTENDENT.

This section extends from a point 33 feet south of the road bridge at Dunham's Basin, to a point 300 feet north of the foot of the combined locks at Whitehall, a distance of 22 miles.

The structures upon this section are: Seven lift-locks, one guard-lock, five waste-weirs, three culverts, twenty-two farm bridges (wood), eight road bridges (wood), two road bridges (iron), four tow-path bridges (wood), four foot bridges (wood), one workshop, five watch-houses, and four dams across Wood creek.

The annexed table shows the expenses of all ordinary repairs done by the superintendent on this section during the fiscal year:

The miter-sill of the lower combined locks at Whitehall leaked badly; a coffer-dam twenty-two feet high was constructed around the mouth of the lock, the water pumped out and a new miter-sill put in; the bottom of the lock cleaned out and thoroughly repaired. A portion of the backing at the head of the Fort Ann combined locks has been taken up and relaid; additional snubbing-posts have

been set at nearly all the locks, and the valves and connections of the combined locks thoroughly overhauled, and general repairs made to other locks on the section. The combined locks at Fort Ann are evidently undermining; the side walls have settled and the locks leak badly; the planking will have to be taken up and the bottom connected, and possibly a portion of the side walls taken up and relaid to make them secure. New circular valves will be needed for Fort Ann combined locks. The lower miter-sill at Fort Ann single lock should be replaced by a new one. As this lock discharges into Wood creek, a coffer-dam will have to be built and the water pumped out.

Five new gates have been constructed and inserted at Whitehall combined, two at Fort Ann combined, and one at Fort Ann single lock. Four new iron and four composite valves have been inserted; five new balance beams constructed and put on, the old rods, valves and connections repaired from time to time, and new fender plank put on all the old gates.

Three new gates will be required at Whitehall combined, two at Fort Ann combined, and one at Fort Ann single; also, two new iron and six composite valves, and six balance beams.

One new foot and one tow-path bridge have been built across Empey's waste-weir, and Eastman's, Blinn's, Empey's, Smith's Basin and Whitehall waste-weirs repaired.

Empey's waste-weir, on twelve-mile level, is in an unsafe condition. It should be rebuilt the coming winter.

The culvert at Walker's, five-mile level, and culvert at Meeker's Bend, twelve-mile level, have been repaired, and the ditches leading to and from the last-named cleaned out.

The west end of Walker's culvert, where break occurred the last spring, is leaking badly, and a portion of it should be taken up and relaid before the opening of navigation in the spring. A new change bridge has been built at Fort Ann, and new farm bridge at Kinner's five-mile level. The following road bridges have been overhauled and repaired: Dunham's Basin, Company, Cook's, Blinn's, and Eastman's.

Needham's, Griffin's, Empey's, Wait's, Kinner's, Johnson's, and Barker's farm bridges, and change bridge in the village of Whitehall, repaired, and the earth approaches to all the above, raised and graveled.

The berme abutment of the road bridge in village of Fort Ann should be rebuilt previous to the opening of navigation.

The State scows on this section have been thoroughly repaired; there should be one new scow constructed during the winter, as the one now in use is worn out and not worth repairing. The watch-houses at Whitehall, combined locks, and Eastman's waste-weir, have been rebuilt.

A bar in the lake at the foot of lower lock at Whitehall, and the remains of an old coffer dam, have been removed by dredging.

The navigable channel of Wood creek was thoroughly cleaned out, and bars and other obstructions, caused by the spring freshets, removed before the opening of navigation in the spring.

The prism of canal on twelve and five-mile levels was well and thoroughly cleaned during spring repairs.

The towing-path on twelve and five-mile levels has been raised and graveled nearly its entire length, and the paved towing-path on Wood creek lined and the paving relaid and repaired wherever necessary.

The dams on Wood creek have been repaired and the gates and slides in the same put in good order.

The slope and vertical wall on twelve and five-mile levels have been repaired and a large amount of new wall constructed on Wood creek, to replace that destroyed by ice in the spring and freshets during the summer.

About three hundred feet of new docking have been constructed at Smith's landing, on Wood creek, the old docking at other points repaired, and the old timber coping on Wood creek replaced with new.

On the 12th day of May, while water was being let in, the culvert in village of Whitehall gave way, it was repaired with as much expedition as possible, and occasioned little or no detention to navigation.

The required depth of water has been maintained during the season without difficulty, and no detention of account, with the exception above mentioned, has occurred.

## I. ORDINARY REPAIRS.

1. *Superintendent's Expenditures for Repairs.*

STRUCTURES OR WORK.	Cost of New Structures.	Cost of Repairs to Old Structures.	Total.
Locks and guard-locks .....	\$2,075 00	\$2,552 47	\$4,627 47
Lock-tending .....		3,720 62	3,720 62
Oil for gates .....		24 93	24 93
Lock-gates .....	3,901 43	1,206 72	5,108 15
Waste-weirs .....	200 00	864 64	1,064 64
Culverts .....		379 30	379 30
Bridges of all kinds .....	2,226 65	1,697 67	3,924 32
State scows .....		566 28	566 28
Watch-houses .....	100 00	69 05	169 05
Dredging at Whitehall .....		751 25	751 25
Raising and repairing tow-path and berme bank .....	900 00	1,840 50	2,740 50
Cleaning out bottom of canal .....	211 00	750 49	961 49
Cleaning out creeks .....		571 80	571 80
Dams .....	400 00	921 30	1,321 30
Slope and vertical wall .....	850 00	1,523 68	2,373 68
Docking .....	1,400 00	1,438 11	2,838 11
Repairs of breaches .....	6,960 24		6,960 24
Breaking ice and assisting boats in consequence of ice .....		608 95	608 95
Removing sunken boats .....		163 84	163 84
Other miscellaneous expenses .....		150 23	150 23
	\$19,224 32	\$19,801 83	\$39,026 15
Clerk hire .....			900 00
Superintendent's salary .....			1,500 00
			\$43,038 35

## II. EXTRAORDINARY REPAIRS.

1. *Drafts on Auditor.*

Enlargement Champlain canal, section 30 and part of section 31, second division (from station 2,600 to Whitehall lock) .....	\$31,620 00
Dredging Whitehall basin (final account settled) ....	15,683 00
Iron bridge, Comstock's Landing (final account settled) ..	4,990 13
Iron bridge at Whitehall (final account settled) .....	4,285 29
Guard-lock on Wood creek .....	26,248 00
Basin south of Whitehall .....	6,817 00
Basin at Whitehall (final account settled) .....	155 25

*2. Miscellaneous Expenditures.*

Land damages settled by commissioner .....	\$600 00
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## III. AWARDS OF CANAL APPRAISERS.

Certificates issued for awards .....	\$10,685 85
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## BLACK RIVER CANAL, SECTION NO. 1.

SAMUEL M. FERGUSON, SUPERINTENDENT.

Extends from the junction of the Black River canal with the Erie canal at Rome, to a point on the summit level 1,000 feet north of lock No. 70, including the Delta feeder, and is 24 miles in length.

The structures upon this section are : Seventy lift-locks, one guard-lock on Delta feeder, five aqueducts, viz., Walsworth's on Mohawk, Wells creek, Stringer's creek, Lansing Kill, and aqueduct over Rome and Black River railroad ; five waste-weirs, viz., Wilcox, Brayton, Hulbertville, Diefendorf's, and one at the head of lock No. 70 ; ten culverts, viz., Wilcox, Farr's, Brayton, Northwestern, Rogers, Keys, Sherman, Yerdon's, and two on Delta feeder ; fifteen road bridges, viz., Whitesborough street, Dominick street and Stanwix street, Rome (all of iron), Ridge Mills, Elmer Hill, Roger's, Diefendorf's, Baker's and Rudd's ; seventeen farm bridges, viz., Huntington's, Crowel's, Wilcox, William's, Farr's, Wager's, Brayton's, Waldo's, Beckwith's, A. Waldo's, Roger's, Utley's, Comstock's, Tubb's, Hulbertville, Yerdon's and Walsworth's, on Delta feeder ; two draw bridges on Delta feeder, two road and change bridges — Walsworth's and Hillside — two private bridges, twenty-one lock-houses, being located one each at locks Nos. 1, 7, 9, 12, 13, 16, 17, 22, 23, 26, 29, 31, 33, 36, 42, 46, 53, 57, 62, 64 and 70, sixteen watch-houses at locks Nos. 3, 4, 5, 14, 19, 21, 25, 27, 38, 47, 49, 51, 57, 64, 66 and 68 ; two dams, one on Mohawk river at head of Delta feeder, and one on Lansing Kill above lock No. 33.

This section was in charge of Charles Parks, superintendent, up to February 1, 1873. The annexed schedule shows the cost of work done by the superintendent since February 1, 1873.

One side of lock No. 40 has been rebuilt at a cost of \$1,848.17.

Locks Nos. 1, 2, 3, 6, 7, 8, 9, 14, 16, 18, 23, 26, 30, 43, 48, 49, 50, 51, 54, 55, 60 and 69, have been repaired by putting in new docking at head and sides and boating gravel for sluices, twelve new



miter sills have been put down and old ones kept in repair by piecing, several locks have been repaired by pointing with oakum and cement, at a total cost of \$1,565.36.

The total cost of tending the seventy-one locks has been \$6,102.50.

There have been thirty-eight lock-gates built, and thirty-three inserted, and materials for five have been obtained and are on hand; the other gates on the section have been kept in good repair, new balance beams, thirty in all, have been put on, new arms, bunting, plank, etc., making a total cost of new and repairs to old the sum of \$5,096.90.

Repairs have been made to Well's creek aqueduct by putting new bent under and raising one side at an expense of \$50.80.

The waste-weir at lock No. 70 has been rebuilt, and three lock valves put in; the Halbertville and Diefendorf waste-weirs has been thoroughly repaired, the whole costing \$369.84.

The culvert near lock No. 20 has been repaired by putting in new road-way at a cost of \$59.

Four new bridges have been constructed, known as Crowel's, Beckwith's, Waldo's and Yerdon's; Huntington's, Floyd, Beckwith's and Rodger's, have each had new abutments put under them; Hillside change bridge, Tubb's bridge and road bridge on Delta feeder have been entirely new planked, repairs have also been made to other bridges on the section at a total cost of \$1,767.72.

Repairs have been made to the state scow on this section, amounting to \$180.18.

There has been expended in raising and repairing towing-path and berme bank at different points the sum of \$679.50.

Cleaning out bottom of canal during spring repairs cost the sum of \$1,391.16.

Eighty-six dollars was expended in cleaning out state dam on Lansing Kill.

There has been expended for watching canal the sum of \$255.

Ninety-two dollars and eighty cents was expended for removing ice at Stringer's creek aqueduct.

Locks Nos. 9 and 55 are undermined and leak badly, and should be repaired the coming year. Some twenty new meter-sills will be required before the opening of navigation next season.

Two new bridges should be built and put up the coming year, viz.: Wager's farm bridge, and road bridge at northwestern. Diefendorf's and Buckhill's bridges require thorough repairs and new abutments.

Willcox's waste-weir is unsafe and should be rebuilt.

New lock-houses for use of lock-tenders should be constructed at locks Nos. 4, 6, 60 and 65.

Well's creek aqueduct requires extensive repairs.

There should be a state-shop built on this section, wherein the property of the state and a supply of materials could be kept on hand and placed for security; as the state owns plenty of land to erect one on, the expense of building would be small. At least twenty-five new lock-gates will be required before the opening of navigation in the spring.

Eight boats have sunk on this section during the past season, none of them causing a detention to navigation nor expense to the state.

A depth of not less than four feet of water has been maintained on the lower miter-sill of the locks on the section during the entire season.

Navigation on this section has been interrupted but one day, caused by a lock-gate going out at lock No. 32.

## I. ORDINARY REPAIRS.

1. *Superintendent's Expenditures for Repairs.*

STRUCTURES ON WORKS.	Cost of New Structures.	Cost of Repairs to old Structures.	Total.
Locks.....		\$3,413 53	\$3,413 53
Lock-tending.....		6,102 50	6,102 50
Lock-gates.....	\$3,304 87	1,792 03	5,096 90
Aqueducts.....		50 80	50 80
Waste-weirs.....		369 84	369 84
Culverts.....		59 00	59 00
Bridges of all kinds.....	992 40	775 32	1,767 72
State scow.....		180 18	180 18
Lock-houses.....		1 50	1 50
Repairing tow-path and berme bank		679 50	679 50
Cleaning out bottom of canal.....		1,391 16	1,391 16
Cleaning out creeks.....		86 00	86 00
Watching canal.....		255 00	255 00
Miscellaneous.....		124 81	124 81
Removing ice at Stringer's creek aqueduct.....		92 80	92 80
	\$4,297 27	\$15,373 97	\$19,671 24
Clerk hire.....			600 00
Superintendent's salary.....			1,000 00
			\$21,271 24
Expended by Charles Parks, superintendent, during the first four months of fiscal year.....			8,662 41
Total.....			\$29,933 65

2. *Miscellaneous Expenditures by Commissioner.*

Agents on Black River canal..... \$1,425 00

## BLACK RIVER CANAL.

## SECTION NO. 2.

*Chester Ray, Superintendent.*

This section extends from a point on the summit level 1,000 feet north of lock No. 70, to Black river, below lock 109, a distance of 12 miles, including also the Moose river improvement; above the dam at Lyons Falls, one mile and a half; the feeder from Boon-

ville to Forestport, ten and one-half miles; the Black river above the dam at Forestport, two miles; and also the North branch, South branch, Woodhull, and Sand Lake reservoirs.

The structures on this section are: Thirty-nine lift-locks, one guard-lock, twelve lock-houses, three watch-houses, one state shop, one timber shed, two keepers' dwelling-houses, one each at North branch and Woodhull reservoirs; two dams on Black river, one aqueduct, six waste-weirs, ten culverts, four stop-gates, seventeen road bridges, twenty-one farm bridges, one iron chord and change bridge, one farm and change bridge, and one tow-path bridge.

The following is a statement of the work done on the section during the fiscal year, ending September 30, 1873.

Pitcher's farm bridge, near Port Leyden, has been rebuilt; and new abutments, and other repairs, have been made to the following bridges: Lyon's Falls road and change bridge, Jones', Willard, Butts' road, and E. Pitcher's farm bridge.

Thirteen new lock-gates have been inserted; thirteen more are completed, and ready for immediate use, and two are nearly finished. The locks and lock-gates in locks Nos. 71 to 109 have been kept in good repair through the season. New sluices have been built around locks Nos. 73, 74, 76, 80, 86, 92 and 98.

The waste-weirs at Forestport, Lee's, and Pitcher's, were braced and strengthened before the opening of navigation last spring.

The bars found in the bottom of the canal and feeder were removed in the spring.

The tow-path and berme bank of the canal and feeder have been raised and strengthened at several points.

The dam at North Lake reservoir has been thoroughly repaired, by putting in new concrete walls on each side of the old break.

The dam at South Lake reservoir has been built about eighteen years, and the sluices (being built of timber) are very much decayed, are unsafe, and should be repaired soon by putting in new timbers.

The road between North and South Lake reservoirs being impassible, should be repaired, by cutting out the timber and rebuilding the bridges and crossways.

The timbers and gates in the waste-weirs at Forestport, Butt's and Boonville, have been so long in use that they are not only unsafe, but cause a great leakage of water, and should be repaired before the opening of navigation in the spring.

The Pitcher road, Jones and tow-path bridge at Boonville should

be rebuilt the coming year, and the Owens, Miller, Courtney, and Konmyer bridges should be repaired.

At least ten new lock-gates should be inserted between locks 71 and 109, and the gates in the guard-lock at the head of the feeder should be rebuilt, as they are old and unsafe.

The docking timbers at the head of many of the sluices are decayed and should be replaced with new timbers.

One boat sunk in the feeder near Forestport, during the season. It caused no delay to navigation.

North branch, South branch, Sand Lake and Woodhull reservoirs were filled during the winter and spring freshets.

The water in North branch, South branch and Sand Lake reservoirs has been entirely exhausted this season and seven feet of water drawn from Woodhull. Should the extreme dry weather continue through the month of October, it will require all the water in Woodhull to keep up navigation on the Rome level of the Erie canal.

No breaks have occurred during the season, and there has been no delay to navigation.

A full depth of four feet of water has been maintained on the lower miter-sill of each lock during the season.

Through the day season it was almost impossible to keep up navigation on the feeder and Summit level, at Boonville, on account of the heavy draught of water for the Erie canal. At the head of the feeder the banks were filled, while at Boonville a depth of two and one-half feet could hardly be maintained. The present size of the feeder is not sufficient to pass the water through that is required, and it should be enlarged.

The business of the Black River canal is increasing yearly.

## I. ORDINARY REPAIRS.

1. *Superintendent's Expenditures.*

STRUCTURES OR WORK.	Cost of New Structures.	Cost of Repairs to Old Structures.	Total.
Locks .....		\$1,206 11	\$1,206 11
Lock-tending .....		4,284 00	4,284 00
Lock-gates .....	1,925 21	1,537 42	3,462 63
Bridges .....	249 63	355 70	605 33
State scow .....	1,300 00	71 33	1,371 33
Small boat .....	9 21		9 21
Raising and repairing tow-path and berme bank .....		1,027 80	1,027 80
Cleaning prism of canal .....		759 91	759 91
Dams .....		11 52	11 52
Breaking ice and assisting boats ..		85 60	85 60
Watching canal .....		338 00	338 00
Miscellaneous .....		148 67	148 67
	\$3,484 05	\$9,826 06	\$13,310 11
Clerk hire .....			900 00
Superintendent's salary .....			1,500 00
			\$15,710 11
Repairing North Lake reservoir and roads to reservoir .....			1,858 10
Sending messengers to reservoir .....			56 00
Keepers of reservoirs, salary .....			1,425 00
Total expended by superintendent .....			\$190,49 21

## II. EXTRAORDINARY REPAIRS.

1. *Miscellaneous Expenditures by Commissioner.*

Completing Sand Lake reservoir and building roads and bridges leading to Woodhull reservoir .....	\$12,664 29
Engineering .....	276 00

## III. AWARDS BY CANAL APPRAISERS.

Certificates issued for awards .....	<u>\$256,379 89</u>
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## SECTION No. 3.

## J. H. ROOT, SUPERINTENDENT.

This section extends from Lyon's Falls to Carthage, a distance of 42 miles, and includes the Black River improvements.

Structures on this section: One road bridge at Carthage (iron), one wood draw and road bridge at Parker Landing, Illingsworth,

[Assem. Doc. No. 6.]

Beach's, Tiffany and Whittley, one lock and dam at Bush's Landing, and lock and dam at Otter creek, and one dam at Carthage, two lock-houses and three bridge-houses and five docks.

A new slope wall has been completed at Bush's lock on the side next the dam, to keep the water from washing away the bank.

Otter creek and Bush's locks are old structures, and require constant care and very careful usage. There has been timber purchased for new gates at Otter creek lock, which will be framed and new gates inserted before navigation opens the next season.

Some of the bridges on this section are old and require constant care and watchfulness. Beach's and Illingsworth swing bridges have been in use many years and are in bad condition, and are liable to give out at any time. Whittley and Tiffany are in good condition; they were thoroughly repaired last season. Parker's bridge is a new structure, completed last season; the Carthage bridge is an iron structure of King's patent; the road and sidewalk both have been newly laid with joist and planked this season. Good navigation has been maintained during this season. The State dredge has been kept at work during the season removing bars formed by tanbark, sawdust and sand, washed in by tributary streams and in high water.

#### I. ORDINARY REPAIRS.

##### 1. *Superintendent's Expenditures for Repairs.*

STRUCTURES OR WORK.	Cost of new Structures.	Cost of repairs to old Structures.	Total.
Lock-tending.....		\$1,103 50	\$1,103 50
Lock-gates.....		194 94	194 94
Bridges.....		1,428 60	1,428 60
State boat and dredge.....		2,103 85	2,103 85
Small boats (1 pair oars and 1 new boat).....		52 25	52 25
Excavating river channel.....		2,548 39	2,548 39
Dams.....		41 12	41 12
Slope wall.....	\$118 03		118 03
Docking.....		232 53	232 53
Breaking ice.....		37 00	37 00
Tools, etc.....		1 50	1 50
Other miscellaneous expenditures.		53 00	53 00
	\$118 03	\$7,796 68	\$7,914 71
Superintendent's salary.....			1,500 00
Clerk hire.....			900 00
			\$10,314 71

## II. EXTRAORDINARY REPAIRS.

1. *Drafts on Auditor.*

Bridge at Parker's Landing (completed and final account settled) .....	\$8,594 65
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2. *Miscellaneous.*

Land damages settled by Commissioner .....	155 00
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## GENERAL REMARKS.

Navigation was opened on this division of the state canals on the 15th day of May, as previously advertised, but was partially suspended on the Champlain canal on account of the improper location and construction of a section of new work, situated about one mile north of Waterford on section No. 1, until the 25th day of May following.

This work was done by contract, and comprised the building of two locks and the construction of about 65 chains of section work of the "Champlain enlargement;" the maps, plans and estimates therefor, having been adopted by the canal board on the 16th day of June, 1871, and the work let by the canal commissioners on the 5th day of July following — before I came into office.

On letting the water into the level, it resulted in an immediate settling of the new banks, in many places from two to six feet, and a break occurred on the same day. The break was repaired promptly, and the water again let into the level on the 17th of May, from which time, until about the 15th of June, a large force of men and teams were employed raising the earthworks and strengthening the banks with sheet-piling and timber cribs filled with stone. On the 25th day of May loaded boats were allowed to lock, and navigation was resumed.

Ex-Canal Commissioner Nelson J. Beach was present and had charge of repairing the break and strengthening the banks a portion of the time, and prepared a statement of the causes and effects of this disastrous delay to navigation, for submission to the canal board, which very pertinently shows the imperfections and errors committed in the location and construction of this portion of the Champlain enlargement.

Mr. Beach's statement read as follows:



"A short distance above Waterford three locks were located upon the Champlain canal, of seven feet lift each. These were located upon a curve in the canal along the base of the hill, requiring the construction of a towing-path only (except for a few rods) for the new canal, and where the material for the bank was of good quality. This curve is very uniform, and at no point 250 feet from center to center of the old and new canals.

The enlarged work is a straight line between the ends of this curve, and is about three-fourths of a mile in length, passing two-thirds of the distance over a bed of peat—or muck, as it is usually termed—from two to nine feet in depth. This material is very light and but little better than sawdust for holding water. In this distance were located two enlarged locks of twelve feet lift each.

Here were two lines not differing in length fifty feet, one with an excellent towing path for five feet of water, and only requiring a small amount of excavation upon the berme side, and a corresponding width and elevation of the towing-path, for the enlarged canal; the other passing two-thirds its length over a peat swamp, requiring embankment upon each side, much of it not less than twelve feet high upon the towing-path side, and some upon the other, leaving the bottom of the canal above the adjoining land. Upon the old line but one bank would have been required (except for a short distance), and the surface of the water would have been but little above the surface of the land, except a short distance at the locks. The new line destroys many acres of very valuable land. On the other line the land taken would have been of little value.

To make a good bank through this peat bed required its excavation to the hard earth, and its deposit upon the outside of the bank or a *puddled wall* twelve feet in width upon the solid earth, and sloping upon its outer side to the top of the bank.

Instead of either of these modes being adopted, a trench eight feet in width was excavated to the solid earth and filled with gravel to the top of the towing-path; inside this a like trench was dug, and a wall of rubble stone was built five and one-half feet in width at bottom and two feet at top, and carried to top of water line; some gravel was also placed in front of this wall. The peat from this trench was placed in the canal bank in rear of the gravel, when it should have been placed entirely without the bank.

The pit for the upper lock was first excavated some twenty rods above its present location, where quicksand was encountered. At its present location, rock was found at seven feet below bottom of

lock; the space was filled with rubble masonry, adding very largely to the cost of the work.

On filling the level above the upper lock, to the necessary depth for passing boats, it flowed over the lock walls; these were increased in height twelve inches with timber, and six inches added to the upper lock gate.

It is claimed by some persons that the canal would have had five feet of water in the three-mile level above the upper lock. It was found on drawing the water two inches below the top of the timber placed upon the gate, that it grounded boats so that it was necessary to *stop locking* until the level filled. This will occur often when lockages are frequent, for the reason that it requires *one-half more water* to pass a boat through the twelve feet lift-lock than it does through the lock next above.

It does not require a great amount of engineering skill to know that, in determining the lift of locks, that a greater quantity of water is required at the upper lock than at the lower one because of the leakage and evaporation.

On the 15th of May the water was let into the Champlain canal, as advertised, which resulted in an immediate settling of the banks above mentioned, and a break occurred on the same day. This break was promptly repaired, and water again let in on the 17th sufficient to float the gravel and stone boats used in keeping the banks above water, and all light boats going north were locked.

On the 23d the canal was filled for the passing of loaded boats when the lower miter sill of the upper lock raised from its fastenings, and it was necessary to draw the water from two levels for its repair.

The water was again let in on the 24th, and navigation was resumed on the 25th, and has continued without interruption, except when it was necessary to stop locking for the purpose of allowing the level to fill.

The banks continued to settle, and three state boats were kept employed in raising and strengthening them (which in portions settled from two to four feet) with stone and gravel besides a large quantity of stone was purchased for that purpose. This work is still in progress owing to settling and sliding of the bank.

To render the work secure required a large amount of sheet-piling and crib-work filled with stone. With all this work breaks were constantly threatened, and the utmost vigilance was required to prevent them. In one instance a slide of the bank commented, and

a serious break was only prevented by the sheet-piling, which had not been completed five minutes before the moving bank reached it.

Persons conversant with this work, and who have been engaged upon this canal many years, estimate the loss to the state from the injudicious location of the new work, including land damages and the expense consequent upon the break and continued settling of bank, at near \$100,000.

In relation to the responsibility of Commissioner Barkley for the imperfections of this work, the location and plans were made and the work under contract before he entered upon the duties of the office. After the work was commenced, and he found the plans were defective, he proposed a radical change in the plan which would probably have prevented the break but increased the cost of the work over the estimate. His suggestions were not concurred in by the canal board, and the work was completed upon the original plan.

WATSON, *June 6, 1873.*

N. J. BEACH.

At a meeting of the canal board, held on the 28th day of May last, I stated my views of the cause of this unfortunate suspension of navigation, which I will here repeat, believing it to be a fair statement of the matter :

MR. PRESIDENT: I desire to say a few words in relation to the recent break in the Champlain canal near Waterford, and the locks constructed at that place. These locks, together with about sixty-five chains of section work, were let by the board of canal commissioners on the 5th day of July, 1871, the maps, plans, and estimates therefor having been approved by the canal board on the 16th day of June previous. This work constitutes a portion of what is known as the Champlain enlargement, which is authorized by chapter 788, laws of 1870. According to the plan adopted, and on which the work has been constructed, the three locks then in use were to be abrogated, and two large locks, having each the very unusual lift of twelve feet, substituted. The section work, being an entire new canal east of the old ditch, was surveyed and laid out through a muck or peat swamp. The plan adopted for the construction of the bank, the details of which I will not take up the time of the board to state, was, in the opinion of Mr. Taylor and myself, radically wrong. But in order to change the plan, a large additional expense above the estimated cost would be incurred, and, consequently, no change of plan could be legally made unless authorized by the canal board.

To change the plan of public work after it has been let, and all the prices fixed, has a tendency, particularly in this age of reform, to create suspicion. And a public officer, especially a canal commissioner, who proposes or advocates any such change, or steps out of the old beaten path, for the purpose of benefiting the public, and, in many instances, to save the state thousands of dollars, is criticised, assailed, and charged with being in league with contractors, or trying to defraud the state.

Appreciating this state of public opinion, the state engineer and myself agreed to bring the matter before the canal board, and ask to have the plan changed in the particulars which it seemed to us were most faulty. We met, as we had expected, a bitter opposition in this board, and after getting the plan changed in one particular, abandoned all hopes of further change, as the attorney-general decided that any such change of plan as we suggested was illegal, and directed the auditor to pay no drafts for work done on change of plan, if such change created additional expense; consequently the work was continued on the original plan. I examined this work during its progress as often as my other official duties would allow me to. I thought the banks were too low, and called the attention of the engineers and contractors thereto, but they gave me the most positive assurance that the banks were up to their full height as the plans contemplated. When the water was let in, the whole bank was found too low, and it became necessary to raise the same from two to four feet, and put timber on the top of the upper lock so as to increase the depth of water one foot. There is a half mile of new canal on the level above the second lock and two and one-half miles of old canal, and in order to give five feet of water in that part of the canal not enlarged, I was obliged to raise the new bank above the lock, until the water was nine feet deep above canal bottom.

I give it as my opinion: First. The plan of construction was wrong. All the old towing-path should have been left in, and the canal widened from the berme bank. Second. The muck and peat should have been excavated and thrown out down to hard bottom, and the entire banks constructed of hard material. Third. There should have been constructed in front of the entire new bank a solid and substantial cement wall.

But these suggestions could not have been carried into effect without an entire change of plan.

The many and various duties imposed by law upon the canal com-

missioner make it not only impracticable, but impossible, to give his personal supervision to each and every distinct work under contract. During the past winter and the present spring there were thirty-nine distinct pieces of work in progress on the eastern division, and it will be seen that the commissioner could not visit each work as often as once in each month, if he devoted one day to each contract in progress.

The immediate supervision of all work under contract, and seeing that the same is, on the part of the contractor, faithfully performed, is charged by law upon the engineer department. They devise the plans, lay out the work, make all estimates for monthly and final payments, and the commissioners can only give a draft to the contractor on the sworn statement of the engineer that such amount is due for work done under the contract.

The commissioner must rely on the engineer for information as to the details of the work under his charge, for no person, unless he is on the work daily, can possibly know whether the different items of work, such as slope and vertical wall, the masonry and concrete, the banks and slopes, are properly constructed, or of such material as the contract specifies.

I think I have sufficiently explained this matter, and while I am willing to assume all the responsibility due to me as commissioner, I have endeavored to make a correct statement of the facts, and I now leave it with the board to determine who, if any one, is responsible for this detention of navigation.

The expense of repairing the break and placing the canal in a safe, navigable condition—along this work—was, in round numbers, \$33,000, and was paid from the appropriation for ordinary repairs of this division, as there was no appropriation for Champlain enlargement applicable to that purpose. This expenditure was in no sense an ordinary repair, and was, in reality, paid for completing a section of the enlargement of the Champlain canal, and should be deducted from the annual expenditure for ordinary repairs on the eastern division during the fiscal year. The legislature should replace the amount expended for this purpose, by an appropriation of money raised by tax.

On the 12th day of May, while letting the water in the canal, a portion of the work which had been done by contract in the village of Whitehall, on section No. 3 of the Champlain canal, the previous winter, gave way, but the break was repaired by the superintendent in charge, before the work at Waterford was completed. This break was in the work under contract for enlarging the Cham-

plain canal, and my remarks in relation to the Waterford work, apply to this. In my opinion, the break could have been avoided by properly constructing the work. The cost of repairing the break was paid from the ordinary repair fund, but is justly chargeable to the fund for enlarging the Champlain canal, but that fund was entirely set apart for other work.

A break also occurred at Port Jackson on section No. 3 of the Erie canal, on the 11th day of May, which was promptly repaired by the superintendent in charge, at a cost of \$1,559.47. Navigation was not delayed, as the breach was repaired before the advertised time for opening.

With the exception of the delay on the Champlain canal above mentioned, and detentions of a few hours at a time caused by displaced lock-gates, sunken boats, or some other unavoidable accident, navigation has been uninterrupted on this division.

The ordinary annual expenditure for repairs on this division has been increased by replacing an entire new timber trunk in Schoharie creek aqueduct, on section No. 3 of the Erie canal, at a cost of \$44,070.12. In my opinion, an entire new structure, such as the above, should not be paid for out of the canal revenues. The average life of these large and costly structures is about twelve years, and when they reach such a state and condition that they can no longer be safely *repaired*, the annual appropriation from the canal revenues "for the payment of the expenses of the *ordinary repairs* of the completed canals, and for no other object or purpose whatever," should not be diverted from its intended purpose, to accomplish what is really an extraordinary expenditure.

The timber trunk at the lower Mohawk aqueduct, on section No. 1, of the Erie canal, should be rebuilt the coming winter; it is old, decayed and rotten, and the suspension of navigation on the Erie canal, in case it should break away during next season, would be very severe. The expense of replacing this trunk will be at least \$80,000, and I earnestly recommend the legislature to make an appropriation for this work early in the session, and authorize the commissioners of the canal fund or the comptroller to invest in the tax any surplus moneys of the sinking fund, under article 7 of the constitution, a sum equal to the amount appropriated, so that the money can be made available at an early day, and this structure put in a condition of safety.

*Supply of Water for the Eastern Division of the Erie Canal.*

The following table shows the reservoirs and feeders which supply this portion of the Erie canal with water, viz.:

## RESERVOIRS ON BLACK RIVER.

NAMES.	Area of surface acres.	Average area acres.	Depth feet.	Capacity cubic feet
Woodhull .....	1,236	1,118	18	876,550,000
North Branch, which can be filled twice yearly.....	423	277	28	310,000,000
South Branch.....	518	372	26	421,190,000
Sand Lake can be filled twice yearly.....	345	306	15	199,879,822
Totals.....	2,522	2,073	.....	1,807,619,822

## FEEDERS NOT NAVIGABLE.

Mohawk river at Rexford Flats.....	0.39
Schoharie creek.....	0.63
Mohawk at Rocky Rift.....	3.92
Mohawk, south side, at Little Falls.....	0.19
Mohawk, north side, at Little Falls, partly navigable.....	0.50
Mohawk at Rome.....	0.05
Oriskany creek feeder.....	0.62
Total.....	6.30

## WATER USED FOR ERIE CANAL.

Name of Feeder.	Cubic feet.	Distance to be supplied in miles.	Quantity furnished in cubic feet per min.
Wood creek at Rome.....	125		
Black River canal.....	1,294		
Mohawk and Black river at Rome...	10,000		
Butt's creek.....	1,000		
Oriskany creek.....	4,561		
Chenango canal.....	911		
Total supply for east end of Rome level.....		56	17,891
Ilion creek.....		3	800
Mohawk river at Little Falls.....		9	12,643
Mohawk river at Rocky Rift.....		27	10,602
Schoharie creek.....		25	6,800
Mohawk river at Rexford Flats.....		20	10,979
Mohawk river from Cohoes dam.....		11	9,570
		150	69,285

The construction of a new reservoir at Sand lake was commenced about the month of August, 1871, by the commissioner in charge (Hon. George W. Chapman), and was substantially completed last fall. It proves to be one of the most reliable and valuable reservoirs in the Black River country; its area of surface, depth, and capacity, is fully stated in the foregoing table.

The dam across the outlet of the "Third Bisby," or Ragged lake, which turns the water from its natural channel, into the new Sand lake reservoir, was carried away by the spring freshet of 1872. This dam has been substantially rebuilt this season, and its earth slopes heavily ballasted with cobble-stones.

The reservoirs at the head-waters of Black river, were constructed for the purpose of supplying the Rome level of the Erie canal, at times when the feeders and water supplies, originally constructed for that purpose, should be insufficient. The unparalleled drouth which has prevailed in this State during the summer and fall, and which threatened at one time to suspend navigation on the Erie canal, has fully demonstrated the wisdom of their construction. The immense quantity of water collected in the northern wilderness, and locked up in these reservoirs, has furnished the Erie canal, this season, about 1,800,000,000 cubic feet of water. On the first day of October the supply at North branch, South branch, and Sand lake, was exhausted, and the water in Woodhull had been drawn eight feet below the spill-way, and yet the entire working force on section No. 5 of the Erie canal, was employed several days during the season, assisting boats aground, on account of low water. But for the supply furnished from these lakes, it would have been impossible to maintain any thing like the required depth of water on section No. 5.

These facts show the urgent necessity of exercising the utmost care and dilligence in keeping the dams, bulk-heads, water-pipes, and other artificial structures, at these reservoirs, in a good, substantial, and safe state of repair.

The forest road, from White lake to Woodhull, has been greatly improved, the new road from Woodhull to Mud lake completed, and a new road commenced from Woodhull to North Branch reservoir, this season, and completed to Sand lake, making four miles of new road built, this year. When the road from Sand lake to North and South Lake reservoirs, a distance of four miles, is completed, these reservoirs can be reached from Boonville by traveling a distance of 28 miles, while we are now compelled to travel 53 miles to reach them by road.



I deem it very important that an additional appropriation of at least \$20,000 be made by the next legislature to complete these roads, and make repairs to these reservoirs, so that they can be easily reached when necessary, and materials for repairing them can be carried in without difficulty.

*Supply of Water for the Champlain Canal.*

The Champlain canal is mainly supplied with water from the Hudson river at Glen's Falls and Fort Miller bridge. The Glen's Falls feeder is 12 miles in length, including the pond above the dam.

The new dam at Fort Miller bridge, authorized by chapter 877, Laws of 1869, has been substantially completed, although the final account has not yet been settled. It is one of the most substantial stone structures in the state. It is now confidently believed that no difficulty will be had in supplying this canal, south of Fort Miller bridge, with abundance of water.

From the junction of the Champlain canal with the Erie, at West Troy, to a point one mile north of Waterford, a distance of five miles, the supply is from Mohawk river, at Cohoes.

From Waterford to Troy dam, a distance of three miles, the communication is by Hudson river.

Glen's Falls feeder, for a distance of two miles, passes over limestone rock, which is full of large seams and openings. Many thousand cubic feet of water percolates through these crevices, and is wasted and lost, which, if saved, would permit the water-powers and mills along the river at that point, to keep in operation a large portion of the summer season. To accomplish this result, the walls on both sides of the canal should be laid in cement; and I respectfully recommend the legislature to appropriate \$25,000 for this purpose.

And I further recommend that an appropriation of \$75,000 be made for the purpose of damming the outlet of lakes and constructing reservoirs at the head waters of the Hudson river. By a proper expenditure of money for this purpose, immense quantities of water could be held back and stored for use in the summer or dry season, and abundance obtained for supplying the Champlain canal north of Fort Miller bridge at all times.

This would also supply the water power at Glen's Falls, Sandy Hill, and Fort Edward, and enable the manufacturers of lumber at those places to run their mills the entire year. These mills furnished in the year 1872 about 400,000 tons of freight to the Champlain canal, paying toll, and increasing the revenue, while this sea-

son, owing to low water, they have furnished scarcely one-fourth of that amount. The large quantity of water which is discharged from the northern lakes into the Hudson river in the spring, creating a volume of water which sweeps every thing before it, would, if retained and kept back as above proposed, save thousands of dollars invested in property from destruction, and furnish the lumber interests along the river abundance of water during the summer drouth for manufacturing purposes.

In addition to the benefits above stated, this water would be available in times of drouth to the shipping interests at Troy and Albany, and lessen the large appropriations for dredging and deepening the river to accommodate commerce in times of low water.

*Supply of Water for Black River Canal.*

From the junction with the Erie canal at Rome to lock No. 9, seven miles, the supply is from the Delta feeder, taken from Mohawk river; from lock No. 9 to lock No. 34, 10 miles, the supply is from Lansing Kill feeder; from lock No. 34 to lock No. 102, 17 miles, the supply is from the Black river feeder; from lock No. 102 to lock No. 109, one and a third miles, the supply is from pond above dam at Lyon's Falls. The river navigation is 43 miles to Carthage.

The water furnished by the reservoirs is drawn only in the very dry season, and passed down through the natural channels of Black river and Woodhull, about 20 miles each, to the pond above dam at head of Black river feeder, known as the Forestport dam, which flows about 150 acres; from thence the necessary quantity is taken into said feeder and passed to the summit level at Boonville. From this point the canal is supplied both ways, and the balance, designed for the use of the Erie canal, is passed off by a waste-weir into the Lansing Kill at the south end of the summit, and after a portion is again taken into the canal at lock 34, from the Lansing Kill dam, thence into the Mohawk river, from whence it enters the Erie canal by the feeder at Rome.

Black river, at its lowest stage in the dry season, would furnish at the dam at Forestport all the water necessary to keep up good navigation in this canal, if its head waters and supplies were not locked up in the reservoirs, consequently the total expense of the reservoirs should be charged against the Erie canal.

*Statement showing the Works constructed for the benefit of the supply of Water on the Eastern division, done or paid for from 1869 to September 30, 1873 :*

North and South Branch reservoirs.....	\$54,893 59
Woodhull reservoir, roads, etc.....	39,489 67
Sand lake reservoir.....	34,227 72
Oriskany feeder.....	32,236 74
Schoharie dam.....	48,525 49
*Rexford Flats dam, award.....	10,832 40
Rexford Flats feeder, work.....	2,500 00
Cohoes dam.....	285,294 16
Sluice at Cohoes guard-lock.....	4,274 86
Repairs, Troy dam.....	77,097 97
Glen's Falls feeder dam.....	115,957 98
Sluice at Saratoga guard-lock.....	7,243 79
Saratoga dam (uncompleted).....	97,005 00
Oriskany awards .....	101,751 57
Schoharie dam awards.....	16,025 10

*Expenditures.*

All expenditures for canal purposes are classed under two heads, viz.: "Ordinary repairs," and "extraordinary repairs." The distinction between ordinary and extraordinary repairs has been so often stated and explained in the reports issued annually by the several departments of the state government, that every person who is at all familiar with canal expenditures must be fully informed upon that subject. But in order to show where the responsibility of these expenditures rests, under existing laws, and to bring the system of canal repairs, appointments and appropriations before the legislature, I will preface my remarks by defining the terms ordinary and extraordinary repairs in the words of the Hon. G. A. Dayton, auditor of the canal department, as expressed in his annual report to the legislature for the fiscal year ending September 30, 1872. He says :

"The term 'ordinary repairs' was employed by those who well understood the distinction between ordinary and extraordinary repairs; those which were necessary to keep and maintain the canals in good navigable condition and efficiency, as they were left when completed; to restore the loss arising from natural decay, and the wear and tear of use and new structures; that which was not a

repair of the old, but the addition of something new, not the keeping of the canals to their original capacity, but adding to their capacity by expenditures for original and new additions.

“Within ordinary repairs may be included whatever is necessary to the keeping of the canals in good condition, at the same width and depth as originally constructed, of completed structures in the same good condition, and in that condition essential to the best navigation of which the canals are capable, and in case of decay or destruction of the structures, the replacing them of the same material of which they were originally formed.

“The term ‘ordinary repairs’ would not include expenditures for enlarging the canal, building new locks or bridges (except to replace old ones where a necessity for new existed), the building of reservoirs or feeders, new culverts or other expenditures of like character, any more than it would include payment for lands taken for canal purposes.”

All expenditures made under the head of ordinary repairs are paid from the canal revenues, and a very large portion thereof disbursed by superintendents of repairs, who are appointed by the canal board. It is true, the canal commissioner must approve each estimate made by any superintendent on his division, before the auditor will advance the money on the same. The remarks of Mr. Dayton on this subject, in his report above referred to, very pertinently show the relation in which the canal commissioner stands to the superintendent of repairs, and are here referred to for the reason that the auditor of the canal department is probably more conversant with this subject than any other officer of the state government, excepting the canal commissioner. He says:

“Various causes contribute to waste and extravagance in the administration of this branch of the canal service. It would be unjust to censure the canal commissioners for the large expenditures in the repairs of the canals. It is true they have the general superintendence of the repairs of the canals, and, among other things, are required to pass over the whole line of their respective divisions once in thirty days — a duty which it is utterly impossible for them to perform, and which at this day, with the present extent of the canals, would not have been imposed. They are charged with the whole police of the canals, and with various duties connected with the examination of canal claims by the canal appraisers, and with attendance upon the canal board, and the hearing of appeals; and these with other duties would seem to make it impossible that they should be able to superintend in detail, the expenditures upon the

more than three hundred miles of canal assigned to the charge of each. They are necessarily compelled to trust to the superintendents of the sections upon the several divisions. The repairs of the canals are practically, to a great extent, intrusted to some thirty superintendents, appointed by the canal board. The compensation allowed by law to this class of officials would not, under the most favorable circumstances, command the highest grade of capability, or the service of those best qualified to perform the duties. These officials are not always appointed by reason of their peculiar fitness for the office. Partisan services are usually, under all administrations, the chief recommendations to appointment. The duties of the position call for skill and experience in the particular work assigned them. None but those having a practical knowledge of the duties in detail can properly perform them. An individual without experience cannot intelligently provide the suitable materials for, or skillfully direct the work of repairs, and will be found entirely incompetent to guard, in advance, against breaks and failures in the canal and structures connected with it, and will be equally incompetent to repair any breaches or defects that may occur, with the requisite economy and dispatch. Without imputing dishonesty or want of fidelity to a superintendent, it is quite evident that the necessity of repairs will be more frequent and their cost much greater under an inexperienced than a skilled official.

“A superintendent, who would best protect and advance the interests of the state, and keep the canals in the best repair at the smallest cost, would and should be able, without aid or counsel, upon an emergency, to direct the reconstruction, upon the best plan, of any part of the canal, or any structure necessary to the preservation of the canals and their navigation. It is probably true that, in many, if not most cases, the same influences which control the appointment of the superintendent, in turn govern him in the selection of his subordinates and in the purchase of his materials, and in fixing the prices to be paid for them. The result is, that the state is the poorest served employer within its limits, and pays the largest sums for the smallest returns.

“Other difficulties tend to add to the embarrassments and increase the cost of repairs. The superintendents are appointed annually, and but a short time before they are compelled to have the canal ready for navigation. Except in case of a reappointment, the person appointed has no knowledge of the condition or wants of his section, and may be under the necessity of learning these matters under great difficulties and unprofitably. This adds not only to the

cost of the repairs, but makes the probability of having a canal in good repair much less than it would otherwise be."

I do not deny that the canal commissioners are in a large measure responsible for the expenditures made by superintendents of repairs. But very many items of expense, incurred by an incompetent superintendent, who has been appointed by the canal board on account of his "political indorsements," would be reduced a large percentage if a competent and efficient man had charge of the work. For instance, a competent man, who has had experience, will raise a sunken boat, in say two hours, at an expense of \$25, when it will take a man who has had no experience two days at an expense of \$200. Suppose a leak occurs in the canal bank, a thorough man, who understands the business, if on hand at the time, will stop the leak and save a break. If the bank is carried away, he will immediately take the proper steps to repair the damage and continue navigation as soon as possible. But, on the other hand, if the superintendent is not acquainted with such matters, or has never had the necessary practical experience, he will not, in the first instance, know how to stop the leak, and in repairing the break, he will be twice as long and at double the necessary expense. These instances apply with equal force to nearly all the expenditures made by a superintendent of repairs. Therefore, it will be seen, that the annual expenditures for ordinary repairs will be swelled thousands of dollars by the appointment of persons to fill the offices of superintendents of canal repairs who have no practical knowledge of the duties they are required to perform.

Again, the interests of the state are very much prejudiced by too frequent changes in canal appointments. A superintendent of canal repairs is appointed for one year. If he is an active, energetic man, and labors for the interest of the state, he will become thoroughly acquainted with the mechanical structures on his section, their state and condition, and obtain a general knowledge of his duties and responsibilities, about the time his term of office expires. In attempting to perform his duty during the year, he has probably offended some prominent politician, on account of having purchased lumber, or some other materials, of a business rival, or he has neglected to repair a dock, or lay vertical wall, in front of some politician's place of business, and to advance his individual interests, or he has appointed a "captain of the state scow" who voted for a constable on the opposition ticket "last spring." And the result of all this is the appointment of a new man by the canal board.

The office of superintendent of canal repairs, since the abolition of the contract system, is a very responsible one. On the eastern division, the average yearly expenditures by each of these officers is \$40,000. And no man should be appointed to take charge of the important and costly structures on our state canals, having the powers conferred by law on superintendents, and expend that amount of money, unless he is in every way calculated to perform the duties of that responsible position. And further, the appointment should be made for at least three years, subject to removal for cause shown. In my opinion, many thousand dollars would be saved to the state yearly, if the system of canal appointments was revised, so that no man would be eligible to hold the office of superintendent of canal repairs until he was shown to be thoroughly acquainted with public works and canal navigation. And, secondly, the term of office should be extended to three years.

Again, the general care and superintendence of the canals is vested, by law, in the board of canal commissioners. That being so, those officers should have the power of appointing and employing the subordinates, who are to act under the direction of the commissioners in caring for, superintending and keeping the canals in repair.

The same wholesome rules which govern an individual, or a corporation in conducting their business affairs, will apply to the government in constructing and repairing its public works. And there is no reason why the same rules, which govern the employment of persons in every other department of the state government, should not apply to the employment of persons on our canals. It would be just as appropriate for the board of canal commissioners to appoint the subordinates and clerks to be employed in the comptroller's office, or the treasurer's office, as it is for the canal board to appoint the superintendents of repairs. And the commissioners of the land office might, with equal propriety, appoint the wardens and overseers in the state prisons.

The directors of a railroad company, after employing a superintendent to take charge of, say 300 miles of railroad, charging him with the responsibility of keeping the same in repair, and running the trains in a safe and proper manner, would hardly employ a conductor, engineer, or brakeman, without the sanction and approval of their responsible agent.

And so it is with a canal commissioner, who is assigned to one of the three divisions of the state canals. The law, in effect, charges on him the responsibility of keeping that division in repair, and in

good navigable condition, and the people hold him responsible for the money expended by his subordinates.

The superintendents of repairs should be appointed by the canal commissioners, and they held strictly accountable for the expenditures made by those officers.

There is a class of expenditures paid from the ordinary repair fund, over which the canal commissioners have no specific control. They are payments for incompleting new work, under contract, provided for in legislative acts. For instance, it is provided in chapter 850, laws of 1872, as follows: "For rebuilding combined wooden locks at junction of Erie and Champlain canals, the sum of sixty thousand dollars, or so much thereof as may be necessary, and if any excess of this amount is needed, it shall be paid out of any moneys appropriated for ordinary repairs of the eastern division of the canals."

"For constructing an iron bridge over the Erie canal at West Troy, forty-five hundred dollars, or so much thereof as may be necessary, and any excess of this amount shall be paid out of any moneys appropriated for ordinary repairs of the eastern division of the canals."

"For rebuilding of stone the state dam now in progress across the Hudson river, near Fort Miller bridge, the sum of sixty thousand dollars, the remainder of the cost to be charged to any money appropriated for ordinary repairs on the eastern division of the canals."

These are but a few of the many appropriations made by the legislature — by virtue of which, the ordinary repair fund is depleted and wasted away — and over which the canal commissioner has no more control than any other member of the canal board.

The constitutional objection to paying for new work out of the canal revenues, is said to be avoided by such appropriations as the above — as the appropriation is for the estimated cost of the new structure *over and above the cost of replacing the old one*.

These acts all provide that the work shall be advertised and let by contract to the lowest bidder — in pursuance of the constitution — in the same manner that all work is done under the head of extraordinary repairs. The state engineer presents the maps, plans and estimates for each item of work specified in the several legislative acts, to the canal board for approval, and if approved, the canal commissioners are authorized and directed to advertise and let the work as above stated, enter into contract with the person or persons to whom the work is awarded, and the contractor enters upon the



performance of his contract. As the work progresses, the resident engineer presents his monthly estimates duly verified, showing the amount of work done, and the sum the contractor is entitled to receive, and the commissioner issues his draft on the auditor for that amount, as provided by law.

The legislature appropriates annually out of the canal revenues, a specific sum of money for the payment of the expenses of the ordinary repairs of the completed state canals, and apportions the same to the three divisions. The exact words used in making the appropriations for some years last past, are: "For the payment of the expenses of the ordinary repairs of the completed canals, and for the sums due the contractors for repairs under their contracts, *and for no other object and purpose whatever*," etc.

The words, "and for the sums due the contractors for repairs under their contracts," have been inserted in each appropriation since the system of keeping the canals in repair by contract was established, and will probably hereafter be omitted, as all repair contracts have expired. It is self-evident from the language used, that such appropriations are intended to pay ordinary running expenses and repairs *only*, and a canal commissioner is often very much embarrassed, by payments from the amount set apart for the ordinary repairs of his division, to satisfy the demands of contractors *for new work*, by virtue of the clause, "and any excess of this amount shall be paid out of any moneys appropriated for ordinary repairs of the eastern division," TACKED on to an appropriation for new work.

The amount actually expended for ordinary repairs on the eastern division, under the sanction of the commissioner in charge, has been swelled thousands of dollars annually by this means, and the responsibility charged to the "extravagance of the commissioner," when, in fact, he is no more responsible for such expenditures than any other state officer who is a member of the canal board.

If new work is to be finished and paid out of ordinary repairs, a separate and specific appropriation should be made to meet such demands.

#### *Champlain Enlargement.*

Work on the enlargement of the Champlain canal has been suspended, for the reason that the appropriations heretofore made for that purpose were exhausted last spring.

The legislature, at its last session, passed an act appropriating \$500,000 to continue the enlargement as contemplated by chap. 788, laws of 1870, but the bill failed to receive the approval of the governor, on

account of a technical defect in its title, after the adjournment of the legislature, so that it was impossible to correct the bill at that session. The work under contract has been suspended and the enlargement delayed one year by reason of this error. I trust the legislature will make an ample appropriation for this improvement early in the session, and at the same time authorize the commissioners of the canal fund or the comptroller to invest in the tax any surplus moneys of the sinking fund, under article 7 of the constitution, a sum equal to the amount appropriated, so that the money can be made available at an early day, and the work pushed to completion as rapidly as possible.

#### *Increased Carrying Facilities.*

The supremacy which the empire state has held from an early period of our national history is the result, in a great measure, of the wise foresight and statesmanship of its early leaders in constructing its magnificent system of internal improvements which gave a vast impetus to the settlement of the western states, and furnishing their only channel of communication to eastern markets, thus secured their immense carrying trade, which developed and enriched our own state in return. But the growth of the west, and its wonderful production, increases in a vastly greater ratio than the facilities we have provided for its transit to market, and it is perfectly clear that, if we wish to retain a controlling position in the internal commerce of the country, we must provide other and greater facilities than we now possess. An immense amount of the business of the west has already been diverted to other routes, both north and south of us, and only prompt action can arrest the diversion so fatal to our state interests. It is evident, that no matter what additional facilities are provided, they will still be inadequate to meet the wants of the ever-increasing volume of business, and that the overflowing granaries of the west will tax beyond their utmost capacity all available routes, and there cannot, therefore, in reality, be any rivalry between routes. In common with others engaged in connection with transportation routes, either canal or railroad, my attention was early attracted to this subject, and, satisfied of the necessity of action by the state in the matter, I introduced a bill in the legislature of 1866, of which I was a member, providing for a survey of one of the contemplated routes, — that connecting lake Champlain with tide-water on the Hudson by improvement of the river, and the construction of a short ship canal. The bill became

a law at that session, and in the course of the summer and fall following, a most careful and accurate survey was made, and the report thereon, a thorough and exhaustive one, on every branch of the subject, was made to the legislature of 1867, and perfectly demonstrates the feasibility of the project and the benefits that would flow from its construction. This report contains many valuable suggestions and much information on the water supply of the canal, and its perusal will afford information and profit. It is evident that the state must provide increased facilities for the transportation of the produce of the west, either by the enlargement of all the present canals to a capacity for vessels of 600 tons, or the construction of the Oswego and Champlain ship canals, or all of them.

The greatest advantage which would accrue from the construction of the Champlain or Oswego route, in my estimation, would be that we should reclaim a large portion of our lost commerce, which, already diverted to the St. Lawrence route, could be again brought into our own state, and to our own market, New York.

The alarming proportion of the diversion of the trade of the west to the St. Lawrence is shown by the fact, that for the current year, the amount of grain landed at Montreal for ocean shipment was fully two-thirds the grain tonnage of the Erie canal for the year 1873.

At the same ratio of increase for the next five years, the amount of cereals delivered at Montreal will be largely in excess of all the grain transported on the Erie canal, without taking into account the increased capacity of the Canadian canals when the enlargement, which is now in progress, to be completed within three years, shall accommodate vessels of 1,600 tons burden, thus, of course, largely facilitating the traffic by that route, and greatly augmenting its ratio of increase.

Whatever my own convictions are, however, I do not deem it becoming in me to make any recommendations on this subject, but leave it, where it belongs, to the people to decide whether they approve these projects, and are prepared to provide the means for their construction.

#### WALL-BENCH.

The wall-bench which still remains on this division, of necessity reduces the capacity of the canal, and is a serious obstruction to a free navigation. In round numbers, there are still remaining about

23 miles,\* and, to place the canal in a state of efficiency, its removal at the earliest practicable period is absolutely necessary. I would, therefore, recommend, as I did in my last report, liberal appropriations for this purpose.

Respectfully submitted,

ALEXANDER BARKLEY,  
*Canal Commissioner*

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\* WALL-BENCH REMAINING ON EASTERN DIVISION.

<i>Not under Contract.</i>		Miles.
On berme bank.....		23.51
On tow-path bank .....		21.69
<i>Under Contract.</i>		
On berme bank.....		3.62
On tow-path bank .....		11.94
<i>Completed during Year.</i>		
On berme bank.....		4.16
On tow-path bank .....		3.07

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# ORDINARY REPAIRS.

STATEMENT showing the amounts expended for ordinary repairs on the Eastern division of the State Canals for the fiscal year ending September 30, 1873, by the Commissioner in charge and the Superintendents of repairs.

CANAL AND SECTION.	By Superintendents.	BY COMMISSIONER.		Total for fiscal year.
		Drafts on Auditor.	Miscellaneous.	
ERIE.				
Section No. 1.....	\$86,698 98	\$18,428 00	\$8,766 82	\$113,893 80
Section No. 2.....	39,794 21	.....	.....	39,794 21
Section No. 3.....	82,805 99	.....	.....	82,805 99
Section No. 4.....	45,775 46	.....	.....	45,775 46
Section No. 5.....	33,613 33	.....	.....	33,613 33
CHAMPLAIN.				
Section No. 1.....	52,507 05	.....	35,205 01	87,712 06
Section No. 2.....	46,443 33	.....	229 25	46,672 58
Section No. 3.....	43,038 35	.....	.....	43,038 35
BLACK RIVER.				
Section No. 1.....	29,933 65	.....	1,425 00	31,358 65
Section No. 2.....	19,049 21	.....	.....	19,049 21
Section No. 3.....	10,314 71	.....	.....	10,314 71
Total.....	\$480,974 27	\$18,428 00	\$45,626 08	\$554,028 35

*COMPARATIVE statement of Expenditures by Commissioners in charge and Superintendents, chargeable to ordinary repairs for the fiscal years ending September 30, 1869, 1870, 1871, 1872 and 1873.*

CANAL AND SECTION.	Expenditures, 1868.	Expenditures, 1870.	Expenditures, 1871.	Expenditures by Com. Chap- man and Suprs. for first three months of fiscal year 1872.	Expenditures by Com. Bark- ley and Suprs. for last nine months of fiscal year 1872.	Total Expendi- tures 1872.	Expenditures, 1873.
<b>ERIE.</b>							
Section No. 1.....	\$256,563 69	\$206,587 76	\$216,590 36	\$148,440 34	\$149,370 18	\$297,810 52	\$113,893 80
Section No. 2.....	65,539 34	122,346 88	43,506 78	41,500 66	25,715 11	67,215 77	39,794 21
Section No. 3.....	35,036 94	183,792 25	62,323 59	25,365 54	53,446 31	78,811 85	82,805 99
Section No. 4.....	31,409 16	79,289 15	52,433 23	25,732 63	28,114 79	53,847 52	45,775 46
Section No. 5.....	22,262 25	76,433 34	43,160 99	21,952 18	27,380 29	49,332 47	33,613 33
Erie Enlargement..	1,192 50						
<b>CHAMPLAIN.</b>							
Section No. 1.....	37,431 79	162,988 14	100,498 20	45,190 18	38,408 11	83,598 29	87,712 06
Section No. 2.....	129,082 90	116,540 88	73,803 43	95,819 61	43,612 39	139,432 00	46,672 58
Section No. 3.....	82,760 67	58,054 36	34,255 08	16,830 74	18,819 70	35,650 44	43,038 35
Supplementary....	4,369 16						
<b>BLACK RIVER.</b>							
Section No. 1.....	19,146 94	76,651 25	34,837 32	22,207 92	22,348 12	44,556 04	31,358 65
Section No. 2.....	71,635 50	112,887 77	51,754 51	15,486 48	17,534 72	33,021 20	19,049 21
Section No. 3.....	20,763 50	26,982 69	11,224 47	4,799 27	7,641 28	12,440 55	10,314 71
Total.....	\$777,194 34	\$1,222,554 47	\$724,388 46	\$463,325 55	\$432,391 00	\$895,716 55	\$554,028 35

Decrease in expenses for 1873, as compared with expenditures for 1869.....	\$223,165 99
Decrease in expenses for 1873, as compared with expenditures for 1870.....	668,526 12
Decrease in expenses for 1873, as compared with expenditures for 1871.....	170,360 11
Decrease in expenses for 1873, as compared with expenditures for 1872.....	341,688 20

*STATEMENT of all expenditures for new work and extraordinary repairs, directed by the Legislature, upon the Eastern division, for the fiscal year ending September 30, 1873, including certificates given for final accounts:*

ERIE CANAL.

Section No. 1.....	\$215,570 86
Section No. 2.....	2,032 09
Section No. 3.....	21,076 29
Section No. 4.....	41,786 29
Section No. 5.....	29,696 03

CHAMPLAIN CANAL.

Section No. 1.....	391,223 86
Section No. 2.....	53,936 96
Section No. 3.....	89,798 67

BLACK RIVER CANAL.

Section No. 1.....	.....
Section No. 2.....	12,940 29
Section No. 3.....	8,594 65
Total.....	\$866,655 86

*Disbursements by Commissioner, not directed by the Legislature, chargeable to extraordinary repairs.*

Awards by canal board for legal services (paid by draft on auditor).....	\$2,718 19
Land damages settled by commissioner.....	3,005 40
Total.....	\$5,723 59





## LABOR AND MATERIALS.

Brought forward.....	\$235,280 00
Lock-tending, 257 locks, 7 months.....	128,240 00
Tending waste-weirs .....	2,000 00
Extra lock-tending, and foreman labor.....	10,000 00
Watching canal.....	15,400 00
General foreman .....	7,700 00
Superintendents' salary.....	16,500 00
Superintendents' clerks' salary.....	9,900 00
Dredging Albany basin.....	25,000 00
Clearing prism of canal, docking and slope wall, including materials for the 11 sections.....	94,000 00
Repairs to breaches, and unforeseen accidents.....	25,000 00
Breaking ice and assisting navigation, in consequence of ice .....	10,000 00
Total.....	<u>\$579,020 00</u>

**STATEMENT** showing the length in miles, number of structures, amount appropriated, amount of work done, for the fiscal year ending September 30, 1873; whole amount of work done, and work completed or settled, with the characteristic details of contracts existing upon the Eastern division of the New York State Canals, for the year ending September 30, 1873.

Length in miles.	No. of structures.	CHARACTER OF WORK.	Appropriation.	Amount done during fiscal year.	Total amount done.	Amount remaining to be done.	Amount paid during fiscal year.
	1	EXTRAORDINARY REPAIRS ERIE CANAL. Laws of 1868: Rebuilding lock 2.....	\$49,500	\$182 67	\$49,902 67	settled.	\$9,374 67
0.30	1 1 ....	Laws of 1869: Iron sidewalk bridge at Cohoes..... Wooden bridge at Ilion..... Wall bench and vertical wall at junction of Chenango canal, Utica.....	2,370 50 4,608 40	2,380 00 .....	2,780 00 5,240 00	..... .....	2,023 00 .....
5.50	1 1 ....	Upper lock at upper side-cut, West Troy..... Lower lock at upper side-cut, West Troy..... Removing wall-bench, etc., from Port Schuyler to lower Mohawk Aqueduct.....	35,700 00 125,000 00 424,360 00	17,220 00 36,400 00 21,500 00 89,760 00 8,612 84 660 00	37,860 00 51,780 00 32,540 00 346,120 00 97,912 84 19,200 00	..... } \$40,680 78,240 00 settled. 29,540 00	14,637 00 32,674 00 14,008 00 75,384 00 7,429 00 561 00
3.75 3.25	.... ....	Removing wall-bench, etc., from locks 43 to 45..... Removing wall-bench, etc., from lower Aqueduct to lock 20.....	..... 48,740 00	..... .....	..... .....	..... .....	..... .....
2.75	....	Laws of 1870: Removing wall-bench, etc., from Canajoharie to Fort Plain.....	.....	12,792 39	34,152 39	settled.	15,996 39
2.90	....	Removing wall-bench, etc., from locks 40 to 41.....	.....	589 07	18,689 07	settled.	3,304 07
2.75	....	Removing wall-bench, etc., from locks 41 to 42.....	.....	7,956 31	17,816 31	settled.	9,435 31

*Extraordinary Repairs Erie Canal — (Continued).*

Length in miles.	No. of struc- tures.	CHARACTER OF WORK.	Appropria- tion.	Amount done during fiscal year.	Total amount done.	Amount remaining to be done.	Amount paid during fiscal year.
		Laws of 1870:					
	1	Iron bridge across Big Basin at Utica, and improving Big Basin.....	.....	\$636 90	\$13,396 90	settled.	\$2,873 90
	1	Stone abutments for bridge one mile above Spraker's Basin.....	.....	368 90	2,708 90	settled.	719 90
	1	Wrought iron tow-path bridge at upper side-cut, West Troy.....	.....	4,840 00	6,380 00	\$3,620 00	3,417 00
	1	Suspension bridge at Lumber District, Albany.....	\$8,000 00	.....	340 00	.....	.....
		Removing wall-benches, etc., west of asylum lot dock, Utica.....	600 00	.....	.....	.....	.....
		Laws of 1871:	.....	3,016 08	3,016 08	settled.	3,016 08
0.20	....	Removing wall-bench and constructing 1,100 lineal feet vertical wall in Rome.....	.....	902 85	5,262 85	settled.	1,556 83
0.20	....	Removing wall-bench from locks 42 to 43.....	.....	4,470 54	4,470 54	settled.	4,470 54
	1	Wooden bridge at Jason street, Utica.....	6,331 50	2,580 00	5,620 00	.....	2,188 00
	1	Whipple cast iron arch truss bridge at Columbia street, Cohoes.....	6,585 00	6,585 00	6,585 00	.....	.....
	1	Wooden bridge at Crescent.....	3,375 50	1,171 09	3,171 09	settled.	1,471 09
		Laws of 1872:	.....				
	1	Iron viaduct over Canal street, Utica.....	.....	2,465 62	3,145 62	settled.	3,145 62
	1	Swing bridge at upper side-cut, West Troy.....	.....	1,990 03	1,990 03	settled.	1,990 03
		Improving approaches to west bridges, Port Jackson, Enlarging culvert west of aqueduct, near Mohawk.....	1,700 00	1,600 00	1,600 00	100 00	1,360 00
		Changing location of abutments at west line of German Flats.....	.....	3,733 93	3,733 93	settled.	3,733 93
			6,000 00	6,100 00	6,100 00	.....	5,185 00

EXTRAORDINARY REPAIRS ERIE CANAL.									
Laws of 1873:									
Improving cemetery road bridge at village of Frankfort.....			1,480 00	1,450 69	1,450 69	settled.	1,450 69		
Wrought iron arch truss bridge (Cooper's plan) at Canal street, West Troy.....			4,500 00	4,500 00	4,500 00	settled.	10,949 84		
Wrought iron Whipple trapezoidal truss bridge at east line of German Flats.....			6,600 00	2,660 00	2,600 00	.....	1,717 00		
Constructing 300 lineal feet vertical wall on tow-path between James and Washington streets, Rome.....	0.56	....	2,500 00	.....	.....	.....	.....		
Constructing slope wall from Frankfort lock to section 102.....	2.	....	22,050 00	.....	.....	.....	.....		
Constructing vertical wall, etc., on berme, between Schuyler and Jason street bridges, Utica.....	.22	....	12,475 00	.....	.....	.....	.....		
Whipple patent lift bridge at Utica.....	1	....	10,000 00	.....	.....	.....	.....		
Constructing slope wall from sluice east of Kast's bridge to Nourse's cut.....	1.75	....	19,480 00	.....	.....	.....	.....		
Constructing slope wall from Ferguson's aqueduct to east line of Utica and from Potter's bridge to lock 46.....	1.32	....	12,450 00	.....	.....	.....	.....		
Extending abutments, etc., to highway bridge at East Frankfort.....			1,410 00	.....	.....	.....	.....		
EXTRAORDINARY REPAIRS CHAMPLAIN CANAL.									
Laws of 1868:									
Dredging Whitehall basin.....			.....	247,124 91	790,124 91	settled.	15,683 00		
Laws of 1869:									
Saratoga dam (excess over wooden dam).....			140,000 00	59,800 00	127,140 00	12,860 00	56,899 00		
Basin near Whitehall.....			1,894 00	113 25	393 25	settled.	155 25		
Laws of 1870:									
Constructing vertical wall at Sandy Hill.....			.....	8,195 15	32,255 15	settled.	11,804 15		
Improvement at Waterford.....			.....	2,322 19	10,522 19	settled.	3,552 49		

*Extraordinary Repairs Champlain Canal — (Continued).*

Length in miles.	No. of structures.	CHARACTER OF WORK.	Appropriation.	Amount done during fiscal year.	Total amount done.	Amount remaining to be done.	Amount paid during fiscal year.
0.56	....	Laws of 1870: Improvement from south end of guard-lock above Schuylerville to Bullard's Bend. ....	.....	.....	\$5,000 00	.....	.....
	1	Aqueduct at Wilbur's basin. ....	\$20,000 00	.....	760 00	.....	.....
	1	Post's combination truss-bridge over Mohawk river at Cohoes.....	.....	\$37,412 73	77,892 73	settled.	\$49,953 73
0.80	2	Laws of 1871: Locks enlarged, size and section work connected at three locks above Waterford .....	40,000 00	22,540 00	40,000 00	.....	.....
	2	Laws of 1872: Rebuilding of stone the combined locks Nos. 1 and 2, Cohoes.....	60,000 00	16,660 00	16,660 00	abandon'd.	14,161 00
	2	Rebuilding of stone the combined locks Nos. 1 and 2, Cohoes.....	60,000 00	42,340 00	42,340 00	\$11,000 00	16,524 00
	1	Wrought iron arch truss-bridge (Cooper's plan) at combined locks, Whitehall. ....	4,300 00	4,285 29	4,285 29	settled.	4,285 29
	1	Guard-lock at Wood creek. ....	25,400 00	25,400 00	25,400 00	.....	26,248 00
	1	Basin south of Whitehall. ....	19,250 00	10,540 00	10,540 00	8,710 00	6,817 00
	1	Raising road-bed in town of Kingsbury. ....	1,000 00	.....	.....	.....	.....
	1	Wrought-iron arch truss-bridge (Cooper's plan), at Comstock's landing. ....	5,000 00	4,990 13	4,990 13	settled.	4,990 13
		EXTRAORDINARY REPAIRS BLACK RIVER CANAL.					
	1	Laws of 1869: Bridge over Black river at Parker's landing .....	.....	241,373 74	448,133 74	settled.	8,594 65
				6,894 65	29,554 65		

ENTANGEMENT, CHAMPLAIN CANAL.									
0.56	....	Improvement from south end of guard-lock above Schuylerville to Bullard's Bend.....	.....	36,700 00	128,060 00	.....	31,671 00	.....	.....
	0.39	Enlarging canal at Salisbury's, from station 1779 to 1810.....	.....	28,440 00	36,478 47	settled.	21,009 00	settled.	.....
0.22	2	Laws of 1871: Locks at the 3 locks above Waterford.....	.....	38,054 00	38,054 00	.....	85,595 00	.....	.....
	1	Laws of 1872: Guard-lock at Wood creek.....	.....	8,020 00	8,020 00	.....	.....	.....	.....
0.30	1	Waste-weir, section 13, and 18 chains section work connected.....	.....	9,651 54	16,111 54	settled.	9,673 00	settled.	.....
	1	Waste-weir, section 20, and 2 chains section work connected.....	.....	3,154 81	11,394 81	settled.	3,400 00	settled.	.....
11	1	Waste-weir, section 28, and 2 chains section work connected.....	.....	100 00	600 00	settled.	.....	.....	.....
	....	Enlarging canal from station 1,429 to 1,453 (Bemis Heights).....	.....	8,000 00	27,460 00	.....	15,861 00	.....	.....
1.	1	Reconstructing the Schuylerville aqueduct on enlarged plan.....	.....	8,400 00	11,000 00	aband'd.	8,959 00	aband'd.	.....
	1	Reconstructing the Schuylerville aqueduct (done under direction of canal commissioner).....	.....	73,758 11	73,758 11	settled.	43,227 70	settled.	.....
1.35	....	Enlarging canal from station 773 to Fort Edward lock.....	.....	20,863 81	45,763 81	settled.	29,059 81	settled.	.....
	1.	Enlarging canal from station 2,219 to 2,300.....	.....	28,140 00	28,140 00	.....	23,919 00	.....	.....
11	....	Enlarging canal, part section No. 30 and the whole of section No. 31, Whitehall.....	.....	35,680 00	37,200 00	.....	31,620 00	.....	.....
	1	Wood farm bridge at station 454, 33.....	.....	3,095 31	3,095 31	settled.	3,095 31	settled.	.....
				\$297,057 58	\$465,136 05	.....	.....	.....	.....
ORDINARY REPAIRS, ERIE CANAL.									
	1	Wrought-iron arch truss bridge (Cooper's plan) at Canal street, West Troy (charge ordinary repairs)...	\$6,450 00	\$6,449 84	\$6,449 84	settled.	.....	.....	.....

*Ordinary Repairs, Erie Canal — (Continued).*

Length in miles.	No. of struct- ures.	CHARACTER OF WORK.	Appropria- tion.	Amount done during fiscal year.	Total amount done.	Amount remaining to be done.	Amount paid during fiscal year.
	1	Whipple cast-iron arch truss bridge at Columbia street, Cohoes (charge ordinary repairs) .....	\$1,110 00	\$735 00	\$735 00	\$375	.....
		Dredging Albany basin .....	.....	5,480 00	5,480 00	.....	\$4,658 00
		.....	.....	\$12,664 84	\$12,664 84	.....	.....
ORDINARY REPAIRS, CHAMPLAIN CANAL.							
	2	Locks at 3 locks above Waterford (ch. ordinary repairs)	\$39,000 00	\$33,246 00	.....	\$5,754	.....
	2	Locks Nos. 1 and 2, and 18 chains section work con- nected, Cohoes .....	.....	.....	.....	.....	.....
		.....	.....	.....	.....	.....	.....
SUMMARY.							
		Extraordinary repairs, Erie canal .....	.....	\$247,124 91	\$790,124 91	.....	.....
		Extraordinary repairs, Champlain canal .....	.....	241,373 74	448,133 74	.....	.....
		Extraordinary repairs, Black River canal .....	.....	6,894 65	29,554 65	.....	.....
		.....	.....	\$495,393 30	\$1,267,813 30	.....	.....
		Ordinary repairs, Erie canal .....	.....	12,664 84	12,664 84	.....	.....
		Ordinary repairs, Champlain canal .....	.....	33,246 00	33,246 00	.....	.....
		.....	.....	\$45,910 84	\$45,910 84	.....	.....
		Enlargement, Champlain canal .....	.....	297,057 58	465,136 05	.....	.....
		.....	.....	\$838,361 72	\$1,778,860 19	.....	.....

LIST OF CERTIFICATES ISSUED FOR AWARDS MADE BY THE BOARD OF  
CANAL APPRAISERS DURING THE YEAR ENDING DEC. 31, 1873.

1873.		<i>Erie Canal.</i>	
Feb'y	13.	Eliza W. Dunlap.....	\$2,369 39
May	13.	Catherine Hatch.....	818 51
	21.	Enoch Snell.....	150 00
June	24.	E. R. Evans.....	240 00
		Buells & Halleck.....	2,897 39
		S. P. & A. H. Halleck.....	13,887 21
		Andrew Dexter.....	36,766 18
		Andrew Dexter, assignee.....	1,000 00
		E. R. Evans.....	294 25
July	2.	Thomas Kelly.....	329 75
		John Corbit.....	604 55
		Benjamin Lunn.....	1,794 34
		Wm. A. Everts.....	4,407 65
	21.	W. B. Peirce.....	1,933 32
	25.	W. T. L. Sanders, ex.....	5,875 00
		Charles Collins.....	5,875 00
		Chas. P. Sanders.....	5,387 50
		E. L. Sanders.....	1,175 00
		John P. Bath.....	1,762 50
		Thomas Harrigan.....	1,762 50
Aug.	19.	Jeremiah Flood.....	1,222 00
		T. P. Sanders, assignee of C. G. Frink...	16,960 00
Sept.	25.	Patrick Rant.....	261 88
		P. Mattoon.....	837 50
		H. Eggleston.....	316 85
		P. G. Joslin.....	229 36
		Mary Covell.....	281 12
Sept.	15.	George Roberts.....	503 81
		Adam Miller.....	576 58
		Wm. & H. Roberts.....	1,097 17
Oct.	15.	Shubael Ladd.....	158 58
Dec.	17.	Andrew Dexter, assignee, and Thomas H. Wood.....	36,380 00

*Champlain Canal.*

Jan'y	27.	George W. Baxter.....	\$2,966 88
Feb'y	14.	Joseph Potter.....	6,924 73



1873.			
Feb'y	26.	Benjamin F. Denio.....	\$399 23
		Henry Bruen.....	320 21
		James Johnston.....	650 24
		John Case.....	863 07
April	3.	Newell W. Holbrook.....	1,607 91
		Lyman Holbrook.....	1,179 13
		Bryan Daly.....	801 62
		Joseph H. Harris.....	715 11
	16.	W. S. Allen.....	122 24
		Jane Davidson.....	112 83
		Robert S. Peck and Samuel Wood.....	559 17
Dec.	17.	William Henry.....	479 98

1872.

*Black River Canal.*

Dec.	5.	Curtis Higby.....	\$145 34
		Brainard Miller.....	71 46
		Charles Miller.....	202 53
		Daniel Edgerton.....	246 61
		R. T. Clark.....	200 15
		Thomas Walsh.....	166 79
		Abijah M. Merrill.....	184 66
		Ann Harvey.....	406 57
		Ansel C. Douglass.....	250 57
		Philo Post.....	213 25
		J. H. Lockwood.....	768 45
		William G. Cooper.....	327 63
		David E. Jones.....	583 78
		Frank Morrell.....	268 06
		William H. Jacobie.....	125 09
		Charles Vollmer.....	976 94
		Charles Ingersoll.....	295 80
		Sally Hilts.....	154 88
		George Davison.....	95 31
		Esther Harris.....	428 90
1873.			
Jan'y	3.	William H. Wilcox.....	71 48
		Walter Johnson.....	352 43
		Delos Smith.....	339 87
		Eola Merriam.....	57 13
		Harvey Dodge.....	208 49
	15.	C. D. Squire.....	522 50
		Caroline A. Loness.....	140 49

1873.			
Feb'y	13.	N. A. Cleveland.....	\$439 80
		Arnold Slocum.....	530 20
		Peter Resha.....	104 00
		Jason Farr.....	163 70
		J. Standing.....	364 38
		Ingham Townsend.....	274 66
		N. J. Beach.....	258 84
		Caleb Bean.....	195 46
		W. C. Van Aernam.....	488 66
		Owen H. Morris.....	464 35
		R. W. Schoonmaker.....	97 62
		Joshua Shepherd.....	317 74
		George Carter.....	124 21
		Anna E. Warmood.....	73 30
		B. F. Tracy.....	92 92
		Leonard S. Standing.....	174 24
		Henry Kitts.....	213 57
		J. N. Pelton.....	232 57
		Alfred Stiles.....	488 66
		Winthrop Norton.....	602 50
	14.	Joel Richardson.....	112 39
		C. F. Runyan.....	137 50
		Norton Bassett.....	1,221 66
	19.	Caleb J. Williams.....	309 68
		Orry Betts.....	178 71
		Seth Wilder.....	91 62
		George B. Anderson.....	15,068 17
		George B. Anderson.....	26,000 00
		John & George B. Anderson.....	607 33
	28.	Platt Williams.....	7,224 71
March	5.	L. J. Goodale.....	238 49
	19.	Theodore P. Ballou.....	178 71
	19.	Emory Allen, assignee.....	869 72
		Towns of Greig and Leyden, Lewis Co...	2,522 89
	26.	Town of Greig.....	243 46
		Anson Blake, Ex'r, etc.....	290 70
		Edwin Pitcher.....	426 90
April	3.	Mary E. McCullom.....	6,239 54
		Hendrick Lamphear.....	295 58
		C. C. Veber.....	4,892 20

1873.		
April	3.	James H. Morrow & Co..... \$6,114 36
		H. H. Dickerman & S. S. Hoyt..... 18,099 49
May	28.	Harvey D. Farrar..... 73 30
June	13.	A. M. Farwell & Co..... 13,934 59
July	29.	R. H. Hall & C. O. Maltby..... 1,595 93
		Hiram S. Briggs..... 1,385 92
Aug.	19.	P. O. Dougherty..... 7,728 67
Sept.	25.	D. H. Scott..... 136 30
Sept.	23.	George H. Scott..... 154 89
		S. C. Hopkins..... 168 65
Nov.	12.	Ira A. Stone..... 30 51
Dec.	2.	Gilderoy Lord..... 1,239 00
	17.	H. H. Babcock..... 868 05

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## MIDDLE DIVISION.

The undersigned commissioner, in charge of the middle division, respectfully submits his annual report for the fiscal year ending September 30, 1873.

The expenditures for all purposes, embracing ordinary and extraordinary repairs for work and payments authorized by the legislature and canal board, and for salaries and miscellaneous, compare with those of the preceding year as follows:

1872.....	\$1,056,071 29
1873 .....	769,311 42
Decrease during fiscal year.....	<u>\$286,759 87</u>

The expenditures for the present fiscal year were incurred as follows:

### *Ordinary Repairs.*

Under late commissioner for first three months of fiscal year:

To pay repair contractors for miscellaneous work and salaries, etc.....	\$40,329 36
By repair superintendents..	62,656 63
	<u>\$102,985 99</u>

Under present commissioner for last  
nine months of fiscal year:

To pay repair contractors for salaries etc.....	\$75,243 62
By repair superintendents,	211,318 56
By appropriations of legis- lature and awards by canal board.....	9,768 71
	<u>296,330 89</u>
	<u>\$399,316 88</u>

This section of the Erie canal passes for many miles through sand cuts, in which large quantities of sand accumulate every year. The country west of Durhamville and south of the canal is subject to overflow. The water sometimes rises so high as to flow over the banks of the canal, as was the case in April last, nearly filling the prism near Cowasselon creek with sand and debris.

A large expenditure must be incurred upon this section for cleaning out the canal every year.

#### REPAIR SECTION No. 8.

FRANK M. SEVERANCE, *Superintendent*, AARON G. FISH, *Repair Contractor*. Contract expires January 1, 1874.

This section extends from Limestone Creek feeder to a point 100 feet west of Nine Mile creek or Camillus feeder, including De Ruyter and Otisco lake reservoirs, Limestone, Butternut and Camillus feeders, each navigable one mile; total, seventeen miles. The structures are: Four double stone lift-locks, three aqueducts, four culverts, one weigh-lock, one wooden farm bridge, three wooden feeder bridges, one wooden towing-path bridge, nine wooden road bridges, two iron tow-path bridges, nine iron road bridges, two feeder dams, one waste-weir, three lock-houses, one state shop.

The expenditures upon this section during the fiscal year were as follows:

Under late commissioner:

#### *Ordinary Repairs.*

Compensation to repair contractor.....	\$5,100 00
Tending feeders.....	264 00
Temporary damages.....	181 00
By superintendent.....	1,269 80
	<hr/>
	\$6,814 80

#### *Extraordinary Repairs.*

Over falls and waste-weir at De Ruyter reservoir.....	\$9,593 12
Raising Geddes road....	3,349 00
Bridge at Warren street, Syracuse.....	6,264 00
Removing bench walls, long level.....	3,651 58
Protecting inner slope, De Ruyter reservoir,	4,352 00
Removing bench walls, Syracuse level. ...	7,173 21
Bulk-head, etc., at De Ruyter reservoir....	196 29
Constructing Butternut creek reservoir....	30,555 13
Furnishing material for Butternut creek reservoir.....	21,000 00

Under present commissioner :

<i>Ordinary Repairs.</i>	
By superintendent.....	\$10,230 43
<i>Extraordinary Repairs.</i>	
Iron bridge at New Boston.....	\$1,736 56
Road bridge near Cowasselon creek.....	1,122 00
Improvement, Cowasselon creek channel...	217 09
Inserting wrought-iron needle beams in bridge at Canaseraga.....	983 68
Constructing vertical wall at Durhamville,	3,971 01
Culvert under bridge approach at Durham- ville.....	794 00
	<hr/> 8,824 34
Total under present commissioner.....	<hr/> \$19,054 77

The following is a detailed statement of expenditures by superintendent, under present commissioner, during the last nine months of fiscal year:

Aqueducts.....	\$20 00
Culverts.....	320 88
Road bridges.....	348 13
Tow-path bridges.....	19 35
State scow.....	210 93
Small boats.....	6 98
Raising and repairing banks.....	2,046 25
Cleaning out bottom canal.....	2,202 43
Cleaning out creeks and feeders.....	219 68
Dams.....	35 55
Slope wall.....	190 00
Repairs of breaches.....	302 21
Cutting ice and assisting boats.....	41 92
Tending reservoirs and feeders, and watching canal...	1,113 87
Mechanics' and merchants' bills.....	262 40
Mowing eel grass.....	131 44
Building rip-rap wall.....	114 00
Flood-rack and guard-piling.....	72 88
Mowing thistles.....	14 00
Miscellaneous.....	757 53
Salaries superintendent and clerk.....	1,800 00
Total.....	<hr/> \$10,230 43

This section of the Erie canal passes for many miles through sand cuts, in which large quantities of sand accumulate every year. The country west of Durhamville and south of the canal is subject to overflow. The water sometimes rises so high as to flow over the banks of the canal, as was the case in April last, nearly filling the prism near Cowasselon creek with sand and debris.

A large expenditure must be incurred upon this section for cleaning out the canal every year.

#### REPAIR SECTION No. 8.

FRANK M. SEVERANCE, *Superintendent*, AARON G. FISH, *Repair Contractor*. Contract expires January 1, 1874.

This section extends from Limestone Creek feeder to a point 100 feet west of Nine Mile creek or Camillus feeder, including De Ruyter and Otisco lake reservoirs, Limestone, Butternut and Camillus feeders, each navigable one mile; total, seventeen miles. The structures are: Four double stone lift-locks, three aqueducts, four culverts, one weigh-lock, one wooden farm bridge, three wooden feeder bridges, one wooden towing-path bridge, nine wooden road bridges, two iron tow-path bridges, nine iron road bridges, two feeder dams, one waste-weir, three lock-houses, one state shop.

The expenditures upon this section during the fiscal year were as follows:

Under late commissioner:

#### *Ordinary Repairs.*

Compensation to repair contractor.....	\$5,100 00	
Tending feeders.....	264 00	
Temporary damages.....	181 00	
By superintendent.....	1,269 80	
		<hr/>
		\$6,814 80

#### *Extraordinary Repairs.*

Over falls and waste-weir at De Ruyter reservoir.....	\$9,593 12
Raising Geddes road....	3,349 00
Bridge at Warren street, Syracuse.....	6,264 00
Removing bench walls, long level.....	3,651 58
Protecting inner slope, De Ruyter reservoir,	4,352 00
Removing bench walls, Syracuse level. ...	7,173 21
Bulk-head, etc., at De Ruyter reservoir....	196 29
Constructing Butternut creek reservoir....	30,555 13
Furnishing material for Butternut creek reservoir.....	21,000 00

Constructing road at Butternut creek reser- voir.....	\$1,600 00	
Opening ditches.....	160 00	
		<u>\$87,894 33</u>
Total under late canal commissioner .....	\$94,709 13	
By present commissioner :		

*Ordinary Repairs.*

Compensation, repair contractor .....	\$10,200 00	
Water agent .....	165 00	
By superintendent of repairs.....	6,792 63	
		<u>\$17,157 63</u>

*Extraordinary Repairs.*

Constructing bridge at West street, Syracuse, .....	\$4,692 00	
Raising Geddes road.....	6,714 63	
Slope-wall on Nine Mile creek feeder.....	714 00	
Constructing Butternut creek reservoir .....	28,070 75	
Constructing road at Butternut creek res'r... ..	3,100 00	
		<u>43,291 38</u>
Total under present commissioner .....	\$60,449 01	

The following is a detailed statement of expenditures by superintendent, under present commissioner, during last nine months of fiscal year :

Locks and lock-gates.....	\$494 41
Lock-tending .....	720 00
Oil for locks .....	7 08
Aqueducts .....	51 13
Waste-weirs .....	15 00
Repairing scales to weigh-lock.....	682 92
Repairing wood road bridges .....	13 64
Repairing state scow.....	164 88
Lock-houses .....	20 90
Timber sheds.....	71 81
Raising and repairing banks .....	492 97
Cleaning out bottom canal.....	414 20
Repairing dams .....	258 54
Slope-wall.....	98 00



Docking .....	\$19 37
Watching canal, tending feeders, etc .....	366 25
Tools .....	55 05
Removing canal-boat from weigh-lock .....	82 30
Thorough repairs to weigh-lock building.....	1,172 85
Cutting eel-grass .....	14 35
Stop-gates at lock 50.....	138 10
Other miscellaneous expenditures.....	43 88
Salaries superintendent and clerk .....	1,395 00
Total .....	<u>\$6,792 63</u>

This section, except that portion from lock 50 to Camillus feeder, is under contract for repairs, which will expire on the first day of January next. The timber trunk of the Limestone creek aqueduct had become badly decayed, and was supported by temporary bents; the contractor was directed to procure new materials and rebuild the trunk entire. This has been done under the repair contract without extra expense to the state.

The repairs, from lock 50 to Camillus feeder, were in charge of the superintendent, and the disbursements therefor made by him.

#### REPAIR SECTION No. 9.

STEPHEN GUTCHESS, *Superintendent.*

This section extends from a point 100 feet west of Nine Mile creek or Camillus feeder to the east line of Wayne county, embracing the Skaneateles and Owasco lake reservoirs and feeders; total, thirty miles. The structures are: Two double stone lift-locks, five aqueducts, two waste-weirs, six culverts, one wooden change bridge, eleven wooden road bridges, six wooden farm bridges, eleven iron road bridges, one iron foot bridge, two guard gates, four feeder dams, three reservoirs.

Expenditures for the fiscal year are as follows:

Under late commissioner:

#### *Ordinary Repairs.*

Tending dam at Otisco.....	\$80 00
Materials for repairing break.....	100 00
Tending feeders.....	504 00
By superintendent.....	<u>24,614 83</u>
	\$25,298 83

*Extraordinary Repairs.*

Railroad basin and vertical wall near Weeds-	
port.....	\$3,648 08
Removing bench walls, Jordan level.....	16,483 83
Improving dam of Owasco outlet.....	1,303 95
Horse-dredge for Owasco outlet.....	600 00
	<hr/>
	\$22,035 86
Total under late commissioner.....	<hr/>
	\$47,334 69

Under present commissioner :

*Ordinary Repairs.*

By superintendent.....	\$45,187 82
	<hr/>
	\$45,187 82

*Extraordinary Repairs.*

Inserting wrought-iron needle-beams in	
bridges at Montezuma and Stephens' and	
Gutchess' bridges at Port Byron.....	\$2,323 80
Vertical wall at Weedsport and Port Byron,	2,261 00
Removing bench wall and constructing slope	
wall on tow-path side, Jordan level.....	5,270 00
	<hr/>
	9,854 80
Total under present commissioner.....	<hr/>
	\$55,042 62

The following is a detailed statement of expenditures by superintendent under present commissioner during last nine months of fiscal year :

Locks.....	\$266 01
Lock-tending .....	1,471 98
Oil for locks.....	24 95
Lock-gates .....	740 65
Aqueducts (rewooding Seneca river and Crane brook)..	23,090 08
Waste-weirs.....	77 80
Culverts .....	16 50
Farm bridges.....	94 57
Road bridges, wood.....	870 10
Road bridges, iron.....	1,263 70
State scow.....	534 23
Lock-houses .....	42 58
Watch-houses.....	58 65
Piling machine .....	164 45

Raising and repairing banks.....	\$3,362 40
Cleaning out bottom canal.....	2,428 42
Cleaning on creek and feeders.....	758 07
Dams.....	1,115 90
Slope wall.....	2,660 49
Docking.....	857 94
Protecting banks with brush and stone, Montezuma level,	1,212 45
Assisting boats.....	85 68
Watching canal and tending feeders.....	950 25
Wheelbarrows.....	131 50
Tools.....	243 79
Drawing out and burying dead horses.....	212 00
Mowing weeds.....	200 77
Repairing wooden trunk at Port Byron.....	143 66
Miscellaneous.....	308 25
Salaries superintendent and clerk.....	1,800 00
	<hr/>
	\$45,187 82
	<hr/>

The expenditures for repairs upon this section have been unusually large this year, from causes not within the control of those in charge.

Upon this section are situated five important aqueducts, having wooden trunks of an aggregate length of about twelve hundred feet. These trunks were constructed during the enlargement, and until now required no important outlay for repairs. Age had produced decay to such an extent as to compel the renewal of all these trunks.

My predecessor had contracted for the delivery of the materials, and the superintendent, under his approval, had contracted for the insertion of a portion of the same in the work. The trunks of the Seneca river and Crane brook aqueducts, 920 feet in length, have been completed, and the material for the Port Byron, Centerport and Jordan aqueducts delivered. The expenditures of the superintendent have been largely increased on account of this work, nearly the entire expense of which has been paid during the fiscal year.

These aqueducts, when renewed, will require no further outlay for repairs for many years.

Extra expense had to be incurred in repairing damages occasioned by the spring flood, which was unprecedented in its effect upon portions of this canal.

The following expenditures are charged to account for general management of the middle division of the Erie canal:

## By late canal commissioner :

Drafts given for salaries, etc., of division and resident engineers.....	\$3,000 00
Commissioner's salary.....	500 00
Salaries division agents and clerks.....	2,543 05
Salaries assistant engineers and inspectors.....	3,643 72
Stationery, postage, telegraphing, etc.....	576 12
Repairs and running expenses state dredge.....	1,382 72
Repairs Syracuse weigh-lock.....	183 43
Commissioner's travel allowance.....	100 00
Miscellaneous expenditures.....	598 78
Total by late canal commissioner.....	<u>\$12,527 82</u>

## By present canal commissioner :

Drafts given for salaries, etc., division and resident engineers.....	\$4,000 00
Commissioner's salary.....	1,500 00
Salaries division agents and clerks.....	4,668 65
Salaries assistant engineers and inspectors.....	8,775 00
Stationery, postage, telegraph, express and printing..	1,245 09
Expenses stationery board of canal commissioners....	2,610 17
Repairs and running expenses state dredge.....	1,057 42
Repairs Syracuse weigh-lock.....	215 32
Commissioner's traveling allowance.....	600 00
Counsel and witness fees.....	5,154 49
Miscellaneous expenditures.....	411 38
Total by present canal commissioner.....	<u>\$30,237 52</u>

Salaries, travel and office expenses of the division and resident engineers are charged to the Erie canal, although their duties extend over the entire division.

### OSWEGO CANAL.

This canal extends from Syracuse to Oswego, thirty-eight miles; and includes the Seneca River towing-path and Baldwinsville canal and the Oneida River improvement. It is divided into two repair sections, as follows :

## REPAIR SECTION No. 1.

DEWITT C. TOLL, *Superintendent.*

This section extends from Syracuse to Three-River Point, and includes the Seneca River towing-path and Baldwinsville canal; total, twenty-one and a half miles.

The structures are: Five stone lift-locks, one wooden lift-lock, one stone guard-lock, four composite culverts, eleven iron road bridges, two iron change bridges, five wooden road bridges, two wooden change bridges, one floating tow-path bridge, one wooden river dam, three waste-weirs, four lock-houses, one state shop.

The expenditures upon this section during the fiscal year were as follows:

Under late commissioner:

*Ordinary Repairs.*

Temporary damages.....	\$197 00	
By superintendent.....	3,244 50	
		<u>\$3,441 50</u>

*Extraordinary Repairs.*

Raising and protecting banks.....	\$5,472 42	
Docks on side-cuts at Salina.....	2,854 98	
Iron bridge at Belgium.....	1,445 00	
		<u>9,772 40</u>

Total under late commissioner.....	<u>\$13,213 90</u>
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Under present commissioner:

*Ordinary Repairs.*

By superintendent.....	\$23,273 63
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*Extraordinary Repairs.*

Iron bridge at Belgium.....	1,666 78
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Total under present commissioner.....	<u>\$24,940 41</u>
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The following is a detailed statement of expenditures by superintendent under present commissioner during last nine months of fiscal year:

Lock-tending.....	\$1,873 47
Oil for locks.....	30 67
Lock-gates.....	1,416 95
Waste-weirs.....	92 90
Culverts.....	14 00

Bridges of all kinds, including abutments.....	\$2,242 76
State scow.....	4 95
Small boats.....	154 22
Lock-houses.....	191 12
Raising and repairing banks.....	4,153 42
Cleaning out bottom canal.....	6,187 82
Dams.....	2,315 50
Docking.....	2,397 90
Cutting ice and assisting boats.....	22 88
Watching canal.....	45 00
Tools.....	76 96
Miscellaneous.....	253 11
Salaries superintendent and clerk.....	1,800 00
Total.....	<u>\$23,273 63</u>

A breach in the dam at Baldwinsville, and general damage to this canal by the spring flood, added considerably to the ordinary expenses for repairs of the section, notwithstanding which the aggregate cost of repairs has been materially decreased from the amount expended during the preceding fiscal year.

#### REPAIR SECTION No. 2.

H. V. SPENCER, *Superintendent.*

This section extends from Three-River Point to Oswego, including the Oneida River improvement, forty-three miles. The structures are: Thirteen stone lift-locks, five stone guard-locks, two steamboat lift stone locks (120 × 30), five wooden waste-weirs, three wooden road bridges, two wooden road and change bridges, six wooden change bridges, one wooden river tow-path and change bridge, six iron road bridges, seven stone river dams, one wooden river dam, one aqueduct, one bulk-head, one draw-bridge, four composite culverts, twenty lock-houses, one state shop.

The repairs of this section were under contract with A. C. Belden until April 24, 1873, when the contractor petitioned the canal board for the abrogation of the same, which was granted. Since that time the repairs and management have been under the control of the superintendent in charge.

The expenditures upon this section, during the fiscal year, were as follows:

Under late commissioner:

*Ordinary Repairs.*

Compensation of repair contractor .....	\$12,306 72
Temporary damages .....	50 00
By superintendent.....	434 07
	<hr/> \$12,790 79

*Extraordinary Repairs.*

Construction high dam.....	\$29,903 00
Coffer dam at Oswego.....	2,986 64
Change bridge near Althouse's.....	607 72
Iron bridge at Minetto.....	5,397 13
	<hr/> 38,894 49

Total under late commissioner .....	<u>\$51,685 28</u>
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Under present commissioner:

*Ordinary Repairs.*

Compensation of repair contractor.....	\$10,650 14
Paid repair contractor for tools and fixtures,	3,870 92
Repairing breaks from spring freshets.....	16,093 98
Temporary damages .....	100 00
By superintendent.....	44,442 38
	<hr/> \$75,157 42

*Extraordinary Repairs.*

Construction high dam.....	22,848 00
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Total under present commissioner .....	<u>\$98,005 42</u>
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The following is a detailed statement of expenditures by superintendent under present commissioner during last nine months of fiscal year:

Locks.....	\$2,016 21
Lock-tending.....	6,716 40
Oil for locks.....	53 22
Lock-gates.....	5,161 80
Waste-weirs.....	74 86
Weigh-locks .....	263 26
Bridges of all kinds.....	639 09
State scows and flat boats.....	292 84
Small boats.....	20 28
Lock-houses.....	219 98

Workshops .....	\$36 27
Raising and repairing banks .....	7,932 35
Cleaning out bottom of canal .....	52 50
Dams .....	3,384 67
Slope and vertical walls .....	646 11
Docking .....	7,391 18
Watching canal .....	416 66
Protecting canal and structures during high water .....	2,401 15
Dredging on section .....	3,045 74
Blacksmith and hardware bills .....	842 67
Sluices .....	378 85
Removing sunken boat .....	48 00
Wheelbarrows .....	116 25
Tools .....	353 83
Miscellaneous .....	363 21
Salaries, superintendent and clerk .....	1,575 00
Total .....	<u>\$44,442 38</u>

Much anxiety was felt by those interested, and fears were entertained that this canal could not be got in readiness for navigation at the time appointed for opening of the same; several of the more important breaches were let by contract, and prosecuted under the direction of the engineer department.

Thus relieved, the superintendent was enabled to perform other work necessary to be done previous to the opening, and the repairs being confined to such portions only as were indispensable to enable the canal to be barely navigated, no delay beyond the time appointed was experienced. Much work then remained to be done to put the canal in a safe and navigable condition; such as raising banks, repairing partial breaches washed out by the river, rebuilding walls and docking which were swept away by the flood, and dredging out bars which had formed in the bottom of the canal. This work has been well done, and the canal, with the exception of repairs to a few lock bottoms which can only be done during the suspension of navigation, is in better condition than before the flood.

The following expenditures are charged to account of general management of the Oswego canal:



By late commissioner:

Salaries, assistant engineers and inspectors.....	\$1,697 00
Expenses state dredge.....	7 90
Total by late commissioners.....	<u>\$1,704 90</u>

By present commissioner:

Salaries, assistant engineers and inspectors.....	\$3,137 50
Repairs and running expenses of state dredge.....	1,088 14
Time-keepers during repairs, by damage done by spring freshets .....	1,673 88
Attorney and counsel fees.....	2,475 80
Total by present commissioner.....	<u>\$8,375 32</u>

### CAYUGA AND SENECA CANAL.

JOHN S. DEY, *Superintendent.*

This canal extends from the Erie, at Montezuma, to Seneca lake, at Geneva, with a branch from lock 9 to East Cayuga, at the foot of Cayuga lake. Total miles in length, twenty-three.

The structures are: Eleven composite lift-locks, one side-lock at Seneca Falls, nine culverts, one pier at foot of Cayuga lake, one pier at foot of Seneca lake, seven iron bridges, fifteen wood bridges, five dams.

The expenditures during the fiscal year were as follows:

Under late commissioner:

#### *Ordinary Repairs.*

Lighting beacon at Geneva.....	\$120 33
Lighting beacon at Ithaca.....	113 33
Lighting beacon at Cayuga.....	60 00
Temporary damages.....	800 70
Miscellaneous.....	141 73
By superintendent.....	6,382 56
	<u>\$7,618 65</u>

#### *Extraordinary Repairs.*

Salaries assistant engineers and inspectors...	\$930 00
Pier at Seneca Falls.....	1,784 53

Stone abutments, etc., De Mont's bridge...	\$1,326 00	
Dredging and other improvements in harbor at Geneva.....	2,290 35	\$6,330 88
		<hr/>
Total under late commissioner.....		\$13,949 53
		<hr/>

Under present commissioner :

*Ordinary Repairs.*

Lighting beacon at Geneva.....	\$224 83	
Lighting beacon and tending harbor at Ithaca.....	225 00	
Repairs and running expenses of state dredge.....	3,144 26	
Award by canal board to George M. Case, assignee, late repair contractor .....	9,768 71	
By superintendent.....	16,517 28	\$29,880 08
		<hr/>

*Extraordinary Repairs.*

Inserting wrought-iron needle-beams in Free bridge.....	\$919 25	
Stone abutments, etc., De Mont's bridge...	585 64	
Iron bridge at Evans street, Geneva.....	1,394 00	
Salaries, assistant engineers and inspectors..	260 00	3,158 8.
		<hr/>
Total under present commissioner.....		\$33,038 97
		<hr/>

The following is a detailed statement of expenditures by superintendents under present commissioner during last nine months of fiscal year:

Locks.....	\$1,520 00
Lock-tending.....	4,290 04
Oil, etc.....	46 91
Lock-gates.....	780 16
Waste-weir.....	68 00
Road and farm bridges.....	403 24
Tow-path bridges.....	1,356 77
Change bridges .....	116 20
State scows.....	157 85
Lock-houses .....	402 67

Workshop and timber-sheds.....	\$60 00
Raising and repairing banks.....	2,630 41
Dams.....	277 09
Docking.....	367 16
Repairs of breaches.....	333 85
Assisting boats.....	383 75
Watching canal.....	204 04
Driving fender-piles.....	610 92
Raising sunken boats.....	488 78
Tools.....	71 07
Miscellaneous.....	148 37
Salaries, superintendent and clerk.....	1,800 00
Total.....	<u>\$16,517 28</u>

There has been no lack of water upon this canal during the past season. Seneca lake and river was raised from the extreme low water of 1872 to an unprecedented height by the flood of April last.

The towing-path of the canal, from Geneva to Mudlock, was submerged for a long time; numerous bars were washed into the canal, and a dredge has worked nearly the entire season in removing them.

Navigation has been well maintained, and in view of the damage sustained by high-water, the cost of repairs are unusually low.

Ithaca inlet, from general fund.

By late commissioner:

Extending pier and dredging harbor at Ithaca.....	\$2,770 68
Construction, piling, etc., at head of Cayuga lake.....	8,058 00
Total by late commissioner.....	<u>\$10,828 68</u>

By present commissioner:

Construction, piling, etc., at head of Cayuga lake.....	\$1,615 72
Dredging harbor at Ithaca .....	289 90
Total by present commissioner.....	<u>\$1,905 62</u>

The appropriations for dredging in the harbor and inlet at Ithaca are exhausted.

Several bars were deposited in the inlet during the spring freshet,

upon which fully-laden boats have grounded, making it necessary to unload a portion of the cargo to enable them to pass.

An appropriation should be made to remove these bars.

A special law is necessary, as the ordinary repair fund cannot be applied to this work.

### CHEMUNG CANAL.

E. B. HUNGERFORD, *Superintendent.*

This canal extends from the head of Seneca lake, at Watkins, to Elmira, including the feeder from Horseheads to Knoxville, making a total distance of thirty-nine miles of navigable canal.

The structures are: Two composite locks, thirteen timber locks, one timber guard-lock, thirty-eight old timber locks, four aqueducts, thirteen waste-weirs, two culverts, one dam and bulk-head, three road bridges (iron), thirty-five road bridges (wood), fourteen farm bridges, one towing-path bridge (wood), one towing-path bridge across Chemung river.

The expenditures upon this canal, during the fiscal year, were as follows:

Under late commissioner:

#### *Ordinary Repairs.*

Maintaining state tug at Corning.....	\$1,413 16	
Miscellaneous .....	114 73	
By superintendent.....	14,607 60	
		<u>\$16,135 49</u>

#### *Extraordinary Repairs.*

Raising and extending breakwater at		
Watkins.....	\$3,536 00	
Dredging from lock No. 1 to Seneca lake,	2,470 00	
Salaries, assistant engineers and inspectors,	2,048 00	
Counsel and witness fees.....	1,404 69	
		<u>9,458 69</u>
Total under late commissioner .....	\$25,594 18	

Under present commissioner:

#### *Ordinary Repairs.*

Miscellaneous.....	\$115 97	
By superintendent.....	34,099 12	
		<u>\$34,215 09</u>

*Extraordinary Repairs.*

Raising and extending breakwater at Watkins.....	\$3,264 00
Iron bridge at Horseheads.....	1,471 50
Counsel fees.....	1,500 00
Salaries, assistant engineers and inspectors.....	1,912 00
	<hr/> \$8,147 50
Total under present commissioner....	<hr/> \$42,362 59 <hr/>

The following is a detailed statement of expenditures by superintendent under present commissioner during last nine months of fiscal year:

Locks.....	\$2,712 31
Lock tending.....	4,822 50
Lock-gates.....	1,226 92
Aqueducts.....	19 63
Waste-weirs.....	231 68
Bridges of all kinds, including abutments.....	3,238 09
State scow.....	54 75
Small boats.....	48 91
Lock-houses.....	113 08
Raising banks.....	709 31
Cleaning out bottom canal.....	2,301 76
Cleaning on creeks.....	106 12
Dams.....	39 37
Docking, at Corning.....	4,822 24
Repairs of breaches.....	7,963 71
Tools.....	185 11
Cutting eel-grass.....	941 88
Raising sunken boats.....	648 29
Repairs and crew of state tug.....	1,277 33
Miscellaneous.....	956 13
Salaries, superintendent and clerk.....	1,680 00
Total.....	<hr/> \$34,099 12 <hr/>

The cost of repairs upon this canal is large, and was principally caused by the spring flood, and a large breach which occurred in the towing-path of the feeder near Gibson's, on the 11th of August last, during a heavy rain storm. Five thousand cubic yards of earth

were carried away, and twelve days were occupied in its repair, during which navigation was suspended.

A large expense was also incurred in the repair of the old wooden docking at Corning, which is an endless source of expense, and sooner or later will have to be entirely rebuilt.

### CROOKED LAKE CANAL.

E. B. HUNGERFORD, *Superintendent*; O. C. KNAPP, *Repair Contractor*. Contract expires January 1st, 1874.

This canal extends from Crooked lake, near Penn Yan, to Seneca lake, at Dresden; distance eight miles. The structures are: Twenty-seven lift-locks, one guard-lock, six waste-weirs, two culverts, fourteen bridges, four dams.

The expenditures upon this canal, during the fiscal year, were as follows:

By late commissioner:

#### *Ordinary Repairs.*

Compensation of repair contractor.....	\$2,195 84
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#### *Extraordinary Repairs.*

Protecting the banks with brush and stone	\$2,657 46	
Brush for protection.....	50 00	
Rebuilding bridge near Russell's mill .....	862 67	
Coping timbers, etc., below guard-lock....	165 18	
		<u>3,735 31</u>

Total under late commissioner.....	<u>\$5,931 15</u>
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By present commissioner:

#### *Ordinary Repairs.*

Compensation of repair contractor.....	\$6,103 14
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Total by present commissioner.....	<u>\$6,103 14</u>
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### CHENANGO CANAL.

This canal extends from the Erie canal at Utica, to the Susquehanna river at Binghamton, ninety-seven miles. It comprises three repair sections, as follows:

[Assem. Doc. No. 6.] 14.

## REPAIR SECTION No. 1.

T. W. W. WASHBURN, *Superintendent of Repairs.*

This section extends from the junction of the Chenango and Erie canals, in the city of Utica, to the foot of lock 81, one mile south of the village of Hamilton, thirty-one miles. The following reservoirs are located upon it: Madison brook, Woodman's pond, Leland's pond, Bradley's brook, Hatch's lake, Kingsley's brook and Eaton's brook, all of which are in the southern part of Madison county. Connected with the section are  $13\frac{1}{2}$  miles of feeder. Total canal and feeders,  $44\frac{1}{2}$  miles. The structures are: Thirty-seven composite lift-locks, four stone lift-locks, four wooden trunk aqueducts, one stone-arch culvert, one guard-lock, twelve arch culverts, seven box culverts, nine waste-weirs, eight iron bridges, forty wooden bridges, one swing bridge, thirty bridges on feeders.

The expenditures on this section, during the fiscal year, were as follows:

Under late commissioner:

*Ordinary Repairs.*

Temporary damages .....	\$331 00	
By superintendent .....	5,598 59	
	<hr/>	\$5,929 59

*Extraordinary Repairs.*

Madison brook reservoir.....	\$16,486 19	
Swing bridge at Hamilton.....	1,768 00	
Iron bridge at Bouckville.....	1,630 46	
	<hr/>	19,884 65
Total under late commissioner .....		<u><u>\$25,814 24</u></u>

Under present commissioner:

*Ordinary Repairs.*

By superintendent.....	\$12,659 41
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*Extraordinary Repairs.*

Swing bridge at Hamilton.....	307 38
Total under present commissioner .....	<u><u>\$12,966 79</u></u>

The following is a detailed statement of expenditures by superintendent under present commissioner during last nine months of fiscal year:

Locks .....	\$2,042 80
Tending locks .....	2,935 37

Lock-gates.....	\$1,310 00
Aqueducts.....	68 70
Waste-weirs .....	35 00
Bridges of all kinds, including abutments.....	546 22
State scow .....	24 60
Lock-houses .....	6 09
Workshops.....	8 10
Cleaning out bottom canal.....	714 53
Dams .....	141 29
Repairs of breaches.....	1,886 53
Watching canal and cutting ice.....	272 24
Tools .....	12 12
Mowing eel-grass.....	282 01
Miscellaneous .....	573 81
Salaries, superintendent and clerk.....	1,800 00
<b>Total .....</b>	<b>\$12,659 41</b>

#### REPAIR SECTION No. 2.

J. R. WHEELER, *Superintendent.*

This section extends from the foot of lock 81 to and including the first farm bridge above lock 100; distance, thirty-four miles. The structures are: Eighteen composite lift-locks, eighteen wooden trunk aqueducts, six waste-weirs, nine bridges on feeders, three iron bridges, three wooden swing bridges, sixty wooden bridges, thirteen arch culverts.

There are six feeders, with an aggregate length of four miles, with dams to the length of 1,000 feet.

The repairs of this section were under contract with John Hull until December 6, 1872, when the contractor petitioned the canal board for the cancellation of same, which was granted. Since that time the repairs have been under the charge of the superintendent.

The expenditures upon this section, during the fiscal year, were as follows:

Under late commissioner:

#### *Ordinary Repairs.*

Compensation of repair contractor.....	\$3,653 67
By superintendent.....	498 50
	<hr/>
	\$4,152 17



*Extraordinary Repairs.*

Swing bridge at State street, Sherburne....	\$459 00	
Swing bridge, etc., at East Main street, Norwich .....	306 00	
		<u>\$765 00</u>
Total under late commissioner.....		<u>\$4,917 17</u>

Under present commissioner:

*Ordinary Repairs.*

Paid repair contractor for tools and fixtures	\$5,076 74	
By superintendent.....	8,870 18	
		<u>\$13,946 92</u>
From repair and trust fund, deposit and in- terest returned to repair contractor .....	\$5,065 37	

*Extraordinary Repairs.*

Swing bridge at State street, Sherburne....	\$323 20	
Swing bridge, etc., at East Main st., Norwich	4,063 00	
		<u>4,386 20</u>
Total under present commissioner.....		<u>\$18,333 12</u>

The following is a detailed statement of expenditures by superintendent under present commissioner during the last nine months of fiscal year:

Locks .....	\$502 22
Lock tending.....	1,950 50
Aqueducts .....	584 24
Waste-weirs.....	45 57
Culverts.....	35 62
Farm bridges.....	592 20
Road bridges.....	537 64
Cleaning out canal .....	481 10
Cleaning on feeders.....	84 49
Dams .....	327 75
Docking .....	72 50
Repairs of breaches .....	1,628 33
Watching canal and cutting ice .....	94 77
Tools .....	15 31
Miscellaneous .....	193 12
Salaries of superintendent and clerk .....	1,725 00
Total .....	<u>\$8,870 18</u>

## REPAIR SECTION No. 3.

J. H. ARMSTRONG, *Superintendent*.

This section extends from the first bridge north of lock 100 to the junction of the canal with the Chenango and Susquehanna rivers, in the village of Binghamton; distance, thirty-two miles. The Stratton and Chenango Forks feeders are located on this section, the Stratton being about fifty rods in length, with a dam 350 feet in length, and having two bridges; one farm, the other towing-path. The Chenango Forks feeder consists of a dam 350 feet in length, with a guard-lock, having a towing-path bridge across it. The structures are: One stone lift-lock, fourteen composite lift-locks, one guard-lock, two dams, seven waste-weirs, five wooden trunk aqueducts, four iron bridges, three wooden swing bridges, fifty-five wooden bridges, ten arch culverts, one bridge on feeder.

The expenditures on account of this section, during the fiscal year, were as follows:

Under late commissioner:

*Ordinary Repairs.*

Chenango street bridge, Binghamton.....	\$95 16
By superintendent .....	2,371 79
Total, under late commissioner.....	<u>\$2,466 95</u>

Under present commissioner:

*Ordinary Repairs.*

By superintendent .....	<u>\$9,245 68</u>
Total, under present commissioner .....	<u>\$9,245 68</u>

The following is a detailed statement of expenditures by superintendent under present commissioner during last nine months of fiscal year:

Locks.....	\$164 65
Lock tending.....	1,476 37
Aqueducts .....	74 12
Waste-weirs .....	26 78
Culverts .....	54 42
Farm bridges.....	796 28
Road bridges .....	734 20
Tow-path bridges .....	17 92
State scow .....	87 26
Small boat .....	14 65

Storehouses .....	\$20 00
Raising and repairing banks .....	169 94
Cleaning out bottom of canal .....	150 52
Dams .....	89 20
Docking .....	152 93
Repairs of breaches .....	3,227 39
Watching canal.....	91 00
Tools .....	33 71
Miscellaneous .....	63 83
Salaries of superintendent and clerk.....	1,800 00
Total .....	<u>\$9,245 68</u>

The following expenditures are charged to account for general management of Chenango canal:

By late commissioner:

Salaries, assistant engineers and inspectors.....	\$1,462 00
Printing and advertising.....	112 49
Investigation, larceny of lumber.....	50 00
Tending feeders.....	70 00
Miscellaneous.....	22 50
Total by late commissioner.....	<u>\$1,716 99</u>

By present commissioner:

Salaries, assistant engineers and inspectors.....	\$1,620 50
Tending feeders.....	140 00
Miscellaneous .....	63 59
Total by present commissioner.....	<u>\$1,824 09</u>

Notwithstanding the severe damage occasioned by the flood of last spring, and the assertion of the auditor that it would cost hundreds of thousands of dollars to repair the same and fit this canal for navigation, the entire cost of the repairs, both ordinary and extraordinary, including salaries and expense of general management for the fiscal year, has been less than one-half the cost during any one of the three years last preceding.

## ONEIDA LAKE CANAL.

This canal, when completed, will connect the Erie canal with the waters of the Oneida lake, furnishing thirty miles of lake navigation, intersecting the Oneida river improvement, which forms a junction with the Oswego canal at Three River Point.

The expenditures for construction, during the fiscal year, were as follows:

By late commissioner:	
Construction, section No. 5.....	\$510 00
Engineering, closing final accounts.....	500 00
Total by late commissioner.....	<u>\$1,010 00</u>

Additional appropriations were made by the last legislature, which, in addition to former ones, are deemed sufficient to complete this work. The old contracts are to be canceled and the work relet. Time will not permit of the completion of this canal in readiness for the opening of navigation next spring, but there will be no difficulty in bringing it into use the following year.

## CHENANGO CANAL EXTENSION.

The expenditures upon this work, during the fiscal year, were as follows:

By late commissioner:	
Construction, section No. 2.....	\$2,439 59
Construction, Binghamton dam and guard-lock.....	11,464 61
Repairs of bridge between Binghamton and Owego....	2,845 16
Constructing bridges under special law.....	553 26
Commutation for bridge.....	800 00
Engineering.....	1,500 00
Total by late commissioner.....	<u>\$19,602 62</u>
By present commissioner:	
Construction, Tracy creek aqueduct.....	\$284 29
Construction, Apalachin creek aqueduct.....	396 01
Bridges between Binghamton and Owego, under special law.....	652 39
Engineering .....	108 00
Total by present commissioner.....	<u>\$1,440 69</u>

The construction of this canal has been abandoned.

No work has been done during the year, except the construction of a few temporary crossings between Binghamton and Owego, authorized by law.

#### LAND DAMAGES.

*Statement showing the payments by draft and certificate on account of awards made by the canal appraisers for land damages, for the fiscal year ending September 30, 1873.*

By late commissioner :

TO WHOM PAID.	ON ACCOUNT OF WHAT CANAL.					Totals.
	Erie.	Oswego.	Cayuga and Seneca.	Draining Cayuga Marshes.	Chenango Extension.	
E. Thompson.....	\$4,513 63	.....	.....	.....	.....	\$4,513 63
*A. S. Page.....	.....	\$19,296 76	.....	.....	.....	.....
Murry & Breed.....	.....	7,564 96	.....	.....	.....	.....
M. Pardee.....	.....	8,000 00	.....	.....	.....	.....
M. Pardee.....	.....	8,000 00	.....	.....	.....	.....
M. Pardee.....	.....	7,940 00	.....	.....	.....	.....
Rhoda Mara.....	.....	4,126 50	.....	.....	.....	.....
Elizabeth Pierce.....	.....	5,901 16	.....	.....	.....	.....
J. O. S. Lynch.....	.....	2,210 68	.....	.....	.....	.....
J. O. S. Lynch.....	.....	6,984 70	.....	.....	.....	.....
Thomas Cullivan.....	.....	2,258 72	.....	.....	.....	.....
Martin Cooney.....	.....	8,418 75	.....	.....	.....	.....
Alonzo Crippin.....	.....	7,414 48	.....	.....	.....	.....
O. W. Clark.....	.....	4,798 05	.....	.....	.....	.....
H. Huntley.....	.....	1,112 51	.....	.....	.....	.....
Lynch & Mara.....	.....	4,634 96	.....	.....	.....	98,662 23
S. D. Willard.....	.....	.....	\$369 83	.....	.....	369 83
P. Voorhees.....	.....	.....	.....	\$6,488 25	.....	6,488 25
James F. Olmstead...	.....	.....	.....	.....	\$1,219 99	.....
John W. Morris.....	.....	.....	.....	.....	1,790 92	.....
James Tobin.....	.....	.....	.....	.....	552 35	.....
Laura La Grange.....	.....	.....	.....	.....	949 05	.....
Laura La Grange.....	.....	.....	.....	.....	474 53	.....
Laura La Grange.....	.....	.....	.....	.....	474 53	.....
John Moore.....	.....	.....	.....	.....	6,289 00	.....
S. D. Phelps.....	.....	.....	.....	.....	1,560 66	.....
Frederick Lewis.....	.....	.....	.....	.....	2,554 40	15,965 42
Total by late Com'r	.....	.....	.....	.....	.....	\$125,999 36

\* Awarded and settled by commissioner.

By present commissioner :

TO WHOM PAID.	ON ACCOUNT OF WHAT CANAL.			Total.
	Erie.	Chemung.	Chenango extension.	
Richard Savage.....	\$2,433 47	.....	.....	\$2,433 47
James S. Locke.....	.....	\$9,562 50	.....	12,628 12
Mrs. Josiah A. Stearns.....	.....	3,065 62	.....	
Jacob F. Coblin.....	.....	.....	\$2,786 51	18,154 45
Avery Olmstead.....	.....	.....	450 73	
R. Collins.....	.....	.....	183 20	
Alexander Perkins.....	.....	.....	3,944 60	
John McKinney.....	.....	.....	455 84	
John Martin.....	.....	.....	120 94	
John Long.....	.....	.....	455 84	
James Filmore.....	.....	.....	869 87	
Samuel Brigham.....	.....	.....	127 92	
Abram Winans.....	.....	.....	664 95	
Rufus K. Amory.....	.....	.....	1,139 61	
Nelly M. Beard.....	.....	.....	170 94	
A. C. Davis.....	.....	.....	159 88	
John L. Mersereau.....	.....	.....	1,057 97	
Catherine Connihan.....	.....	.....	282 54	
David Foster.....	.....	.....	150 96	
Susan Morse.....	.....	.....	998 87	
Mary Whitney.....	.....	.....	3,198 08	
Hannah and Sabra Willis..	.....	.....	743 32	18,154 45
Charles R. Crocker.....	.....	.....	191 88	
Total by present Com'r..	.....	.....	.....	\$33,216 04

*Summary of Land Damages.*

By late commissioner (first three months of fiscal year)..\$125,999 36

By present commissioner (last nine months of fiscal year).. 33,216 04

Total land damages.....\$159,215 40

*STATEMENT showing names of repair contractors, annual compensation, etc.*

CANAIS.	No. of section.	Names of contractors.	Annual compensation.	Date of contract.	Expiration of contract.
Erie.....	8.....	Aaron G. Fish.....	\$13,000	March 1, 1889	Dec. 31, 1873
Crooked Lake..	All....	Oliver C. Knapp...	7,750	March 1, 1889	Dec. 31, 1873

# RECAPITULATION

OF EXPENDITURES FOR ORDINARY AND EXTRAORDINARY REPAIRS, LAND DAMAGES, ETC., UPON THE MIDDLE DIVISION OF THE NEW YORK STATE CANALS, FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1873.

*Payments under late commissioner were made during first three months, and by present commissioner last nine months of fiscal year.*

CANAL AND SECTION.	ORDINARY REPAIRS.			EXTRAORDINARY REPAIRS.		LAND DAMAGES PAID BY		Totals.
	Expended by late canal commissioner.	Expended by present canal commissioner.	Expended by superintendent under late canal commissioner.	Expended by superintendent under present canal commissioner.	Expended by late canal commissioner.	Expended by present canal commissioner.	Late canal commissioner.	
Erie, section No. 7.....	\$3,300 00	.....	\$3,634 39	\$10,230 43	\$5,984 04	\$8,324 24	.....	\$22,033 20
Erie, section No. 8.....	5,545 00	\$10,305 00	1,200 80	6,732 63	87,804 33	43,201 38	.....	155,158 14
Erie, section No. 9.....	8,684 10	.....	24,614 63	45,187 82	22,035 86	9,554 80	.....	102,377 31
Erie, general management.....	197 00	16,308 03	.....	23,373 63	9,773 72	13,629 49	\$2,433 47	49,712 44
Oswego, section No. 1.....	12,356 72	30,715 04	3,244 50	44,442 38	38,804 49	22,848 00	.....	38,154 31
Oswego, section No. 2.....	7 90	2,782 02	434 07	.....	1,697 00	5,613 30	.....	149,690 70
Oswego, general management.....	1,236 00	13,362 80	.....	16,517 28	6,330 88	3,158 80	98,632 23	47,338 33
Cayuga and Seneca.....	.....	.....	6,382 56	.....	10,838 68	1,405 62	.....	12,734 30
Utica Inlet.....	.....	.....	.....	.....	9,458 69	8,147 50	.....	80,581 80
Chenango.....	1,537 89	115 97	14,000 60	34,000 12	3,735 31	.....	12,638 12	12,034 20
Crooked Lake.....	2,155 84	6,103 14	.....	.....	.....	.....	.....	38,781 03
Chenango, section No. 1.....	331 00	.....	5,508 50	12,650 41	19,884 65	4,386 20	.....	23,250 20
Chenango, section No. 2.....	3,653 67	5,076 74	498 50	8,870 18	765 00	.....	.....	11,712 63
Chenango, section No. 3.....	95 16	.....	2,371 79	9,245 68	.....	.....	.....	3,541 08
Chenango, general management.....	254 99	.....	.....	.....	1,462 00	1,630 50	.....	1,010 00
Oneida lake.....	.....	.....	.....	.....	1,010 00	.....	.....	55,103 18
Chenango extension.....	.....	.....	.....	.....	19,602 62	1,440 60	15,985 42	6,488 25
Draining Cayuga marshes.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	\$40,329 35	\$85,012 33	\$62,556 63	\$211,318 56	\$242,990 67	\$126,994 87	\$125,999 36	\$638,536 82

*STATEMENT showing expenditures upon each canal of the Middle Division for all purposes (excepting land damages), for the fiscal year ending September 30, 1873 :*

NAME OF CANAL.	Expenditures under late Commissioner, first three months.	Expenditures under present Commissioner, last nine months.	Totals.
Erie.....	\$167,550 07	\$164,783 92	\$332,333 99
Oswego.....	66,604 08	131,321 15	197,925 23
Cayuga and Seneca, includ- ing Ithaca inlet .....	24,778 21	34,944 59	59,722 80
Chemung .....	25,594 18	42,362 59	67,956 77
Crooked lake .....	5,931 15	6,103 14	12,034 29
Chenango.....	34,915 35	42,369 68	77,285 03
Oneida lake.....	1,010 00	.....	1,010 00
Chenango extension.....	19,602 62	1,440 69	21,043 31
Totals .....	\$345,985 66	\$423,325 76	\$769,311 42

*Summary (not including land damages).*

Total expenditures for first three months of fiscal year, under late commissioner.....	\$345,985 66
Total expenditures for last nine months of fiscal year, under present commissioner.....	423,325 76
Total .....	<u>\$769,311 42</u>

*Summary (including land damages).*

Total expenditures under late commissioner for all purposes.....	\$471,985 02
Total expenditures under present commissioner for all purposes .....	456,541 80
Total .....	<u>\$928,526 82</u>

*General condition and wants of the Canal of the Middle Division.*

The unprecedented flood of April last damaged the canals of the middle division to such an extent as to add materially to the amount of work ordinarily required in fitting them for navigation. The whole of the Oswego, Cayuga and Seneca, and portions of the Erie, Chemung and Chenango canals were inundated.



The Oswego was completely submerged throughout its entire length; works that had been built upon the supposition that they were high enough to escape the highest floods, were swept by the waters of the Seneca and Oswego rivers, which in some places broke into the canal, and, following its course for awhile, would again break out of it, sweeping away the banks, forming large breaches in many places, and scouring the top and sides many feet in depth. The mechanical structures suffered severely, and in some instances were only saved from total destruction by temporary works hastily erected for their protection.

The east abutment of the high dam and the adjacent lock were at one time in imminent danger of being carried away, a disaster which would have been followed by the destruction of a portion of the old dam itself. Large quantities of brush and stone were promptly used in the breach, and by persistent effort the structures were saved.

Upon the other canals of this division the effect of the flood was not so disastrous, yet considerable damage was done. The preventive measures adopted and used lessened the damage largely, and great credit is due the officials in charge for their efforts and watchfulness in guarding the interests confided to them, and especial credit is due the engineer department for timely suggestions made for the erection of works to prevent more serious damage.

The dam in the Seneca river at Baldwinsville was breached. The feeder dam on the Owasco creek near Port Byron, carried away, the dam at Owasco lake undermined. The embankment across the Cayuga marshes damaged, and numerous breaches in the banks of nearly all the canals were made, and large quantities of earth and sediment were deposited therein.

The work of repairs was from the first confined to the main breaches, which were so far completed as to permit the canals to be opened at the time appointed. Other repairs were made after the opening of navigation, such as raising the banks to their proper height, and permanent works substituted for temporary ones.

Navigation, except from low water, has been practically uninterrupted on the more important canals of this division, and detentions of any note have occurred only upon the Chemung and Chenango canals, and were caused by breaches in the banks. One in the Chemung canal feeder near Gibson's interrupted navigation twelve days, and small breaches on section No. 3, of the Chenango canal, detained boats for a short time.

The only lack of realizing perfect navigation on the Erie canal is

caused by low water upon the Jordan and long levels. Boats have occasionally grounded during the past season upon the long level near Manlius. This is in consequence of low water, and occurs generally during the prevalence of westerly winds. One cause of low water on the long level arises from the necessity of feeding the Syracuse level in order to maintain seven feet depth, and occasionally the formation of a bar at the foot of lock 49 has made it necessary to keep seven and one-half feet of water upon the lower miter-sill of the locks in order to prevent boats grounding on the bar. The state has rented the surplus water on the Syracuse level and the height of the weirs over which water is used was established by authority of the canal board at six and three-fourths feet only above canal bottom. At times it has been necessary to feed this level (to prevent boats grounding) against a flow of from six to seven inches over these weirs, one of which is one hundred feet, and the other about eighty feet in length. A feed must also be kept up against a flow of three inches over them even to maintain seven feet of water. During the prevalence of low water upon the long level, it was found that lock-tenders were in the habit of feeding from the long level to float boats on the Syracuse level and against this draft over the weir, when at the same time boats were aground on the long level. These facts having been brought to the notice of the commissioner and division engineer, the latter was requested to ascertain whether there was, by the ordinary workings of the locks, without extra feeding, a surplus of water thrown upon the Syracuse level. The result of his observations and calculations is that, with a proper and economical use of the locks, there is no surplus after supplying the demands of the canals, and for pumping salt water, on the Syracuse level with the present trade, and that with a draft of three inches of water over even one of these weirs extra feeding is necessary to maintain the proper depth of seven feet. In the judgment of the undersigned, these weirs should be raised to seven feet above canal bottom, and if necessary the banks should also be raised, so as to permit the retention of the water with safety to seven and one-fourth feet above canal bottom at all points, except at these weirs. The waste at the weigh-lock and at the Salina lock could also be correspondingly raised so as to compel the water (as now) to flow over these weirs first to a depth of at least three inches before waste occurred elsewhere. The owners of water rights would then get the surplus when there is any, and the state would not be obliged to feed against a continual waste, to the detriment of navigation upon the long or Jordan levels. The commissioner would respectfully

ask that the legislature authorize him to do this work and appropriate the sum of \$10,000 therefor.

The last of the repair contracts upon the canals of this division will expire on the first day of January next, and under the present law the repairs will hereafter be made by superintendents, or by such other method as may be determined by the canal board.

#### ERIE CANAL.

The undersigned would respectfully urge upon the legislature the importance of widening to a width of twenty feet all the locks upon the Erie canal that have an upward lift eastward, that is, in the direction of the heaviest tonnage. Both locks Nos. 49, and the tow-path locks Nos. 47 and 48, have been widened two feet, and experience has demonstrated that the measure was a wise one. A fully-loaded boat can be locked through one of the widened locks in about one-half of the time required in the narrow one. The capacity of the canal will be materially increased by thus facilitating the passage of boats through these locks. I would also recommend in this connection that tumble gates be inserted at the head of these locks, and also at the head of lock No. 50. A saving of water can be effected in this way, as the tumble gates do not leak more than one-half as much water as the old style of gate. The estimated cost of widening all these locks, including the insertion of tumble gates, is \$70,000.

#### BUTTERNUT CREEK FEEDER.

The construction of this work was commenced by my predecessor in 1872, and has been prosecuted by the undersigned during the present season. Unexpected difficulties have been met with in securing a safe foundation for the west end of the stone dam, which has added materially to its cost and caused delay in its construction. The work is so far advanced as to insure its completion early next year if the necessary funds are provided. The amount required is \$40,000, which should be appropriated without fail. The use of this reservoir is important as a feeder to the west end of the long level, in order to regulate the fluctuations which are common at this point. Its close proximity to the canal will enable a lack of water to be supplied quickly and without the delay heretofore experienced.

#### BENCH WALLS.

Contracts have been let for the removal of all the bench wall upon the towing-path side of the Jordan level. The appropriations have

Also been made, but no funds will be available therefrom until the 1st of October, 1874, unless the commissioners of the canal fund will consent to borrow the money in advance. It is important that this work be done next winter, and it is hoped that the commissioners of the canal fund will anticipate the appropriation and provide the necessary means for its completion.

A further appropriation of at least \$75,000 should be made by the next legislature to commence the removal of the bench wall upon the berme side of this level. Provision should also be made by an appropriation of \$10,000 for the removal of the balance of the bench wall on the Syracuse level and the substitution therefor of vertical walls.

#### OWASCO FEEDER.

The wooden trunk that conveys the water from this feeder to the canal at Port Byron is completely decayed and will not answer its purpose any longer. A new and permanent feeder channel should be constructed. The estimated cost is \$15,000.

#### OSWEGO CANAL.

The high dam upon this canal will be entirely completed before winter, and no further appropriations will be needed. This was the last of the old wooden dams on the Oswego river, the others having been previously rebuilt of stone. The new high dam is also built of stone resting on a timber crib founded on rock. The foundation is believed to be safe and permanent.

The contract for rebuilding broken culvert at Oswego has been let, but no funds being available under the appropriation until next October, its completion must be delayed another year.

#### CAYUGA AND SENECA CANAL.

The sum of \$40,000 was appropriated by the last legislature for constructing a dam in the Seneca river at Waterloo. A provision in the law requires that the top of the breast walls in front of the mills shall be put three feet below the top of the spillway of the dam, and that the dam shall be of the same height as the present one. The engineers report that this will allow mill owners to draw more water than now, and will prove beneficial to them only, and of no benefit to the state. No attempt has been made to construct a new dam under this law, as the state will receive no benefit thereby. No trouble has arisen from low water this year upon this canal, but the same hindrance to navigation as that experienced in 1872 is liable to occur next or in any other year. The law should

be amended allowing the canal board to fix the height to which mill owners shall be allowed to draw water for hydraulic purposes.

THE LATERAL CANALS,

*Comprising the Crooked Lake, Chemung, Chenango, etc.*

No more work has been done upon these canals than was absolutely necessary to maintain an indifferent navigation. More cannot be done without an entire rebuilding of a great many dilapidated structures. The condition of the Chemung canal is somewhat better in its structures than some of the others, but being composed principally of timber, they will, at no distant day, have to be again renewed. The docking at Corning is constantly failing, and large expenditures are required in its maintenance. Many locks upon the Crooked Lake canal need rebuilding, and some of the walls have been pushed inward, so as to leave barely room for boats to enter them. Some have to be widened by cutting away the face of the stone work to get width enough to pass boats through them.

Numerous locks and aqueducts upon the Chenango canal are so worthless that the commissioner feels called upon to ask an appropriation of \$25,000 over and above the usual amount required to fit the canal for navigation, to be applied to repairing locks and aqueducts. A similar amount will be required every year, or navigation will have to be abandoned. The expenditures upon these canals the past season have been kept down to the lowest possible limit, and of the structures that have actually failed, none have been thoroughly repaired, but such make-shifts and temporary expedients have been adopted as would merely hold water in the canal. These are liable to fail; and cannot be relied upon to maintain navigation another season. The increased coal trade upon the Chenango canal has added considerably to its towage during the present year, and promises a still larger increase in the future.

The commissioner has reason to be satisfied with the foregoing exhibit of expenditures upon the middle division, in having so largely reduced the amount as compared with previous years. No money has been wasted upon worthless projects, and it is difficult to point out how any of the expenditures incurred during the nine months of his administration could have been lessened without an absolute disregard of the important interests committed to his charge. It is believed that the commissioner is in a position to be better qualified to judge of the necessity of these expenditures than the accounting officer of the state, sitting in a distant office, can possibly be, and who, in his wisdom, assumes to know when expenditures are

unnecessary, and mistakenly considers that his duties extend to the ordering and directing of such officers in charge of the navigation and repairs of the canals, as are subordinate and responsible to the commissioner only.

For a more detailed explanation of the progress of new work and extraordinary repairs upon this division, attention is called to the following tables hereto annexed.

Table No. 1, is a statement of new work and extraordinary repairs under contract upon the middle division, showing the amount done, and amount remaining to be done.

Table No. 2, is an account of miscellaneous work not under contract, but done under the inspection of the engineer department.

I cannot close my report without referring to the manner in which the engineer department on this division has been managed. Howard Soule, Jr., division engineer, is not only entitled to my thanks, but the thanks of the people of the state of New York, not only for the assistance rendered me in the discharge of my duties, but for the interest he has manifested in the welfare of the canals.

Thomas Goodsell, resident engineer, has been a faithful and efficient officer, and has discharged the duties which have devolved upon him in a praiseworthy and satisfactory manner, and my thanks are due to all of their assistants for the very satisfactory manner in which they have severally discharged the various duties devolving upon them to perform.

All of which is respectfully submitted.

R. W. STROUD.

TABLE No. 1.  
*Statement of work under contract upon the middle division of the New York State Canals, for the fiscal year ending September 30, 1873.*

CHARACTER OF WORK.	Estimat'd cost at contract prices.	Amount done during fiscal year.	Total amount done.	Amount remaining to be done.	Remarks.
ERIE CANAL					
Raising berme bank, etc., near lock 50 .....	\$8,256 77	\$856 77	\$8,256 77	.....	Final rendered.
Raising Geddes road at Syracuse .....	17,243 63	10,063 63	17,243 63	Settled.	Contract of canal com'r.
Removing wall-benches on Jordan level .....	103,914 83	1,054 83	103,914 83	Settled.	
Removing wall-benches on Syracuse level .....	50,829 21	.....	50,829 21	Settled.	
Removing wall-benches on Long level .....	16,095 58	1,455 58	16,095 58	Settled.	
Slope-wall on towing-path side Nine-mile creek feeder .....	3,397 50	840 00	2,500 00	\$897 50	
Overfall and paved waste at outlet to De Ruyter reservoir .....	11,905 12	7,405 12	11,905 12	Settled.	
Removing wall-benches and substituting slope or vertical walls on Long level .....	20,180 00	.....	.....	20,180 00	
Improvement of Cowasselon creek channel .....	1,424 09	824 09	1,424 09	Settled.	
Road bridge near Cowasselon creek .....	3,700 00	1,760 00	3,560 00	140 00	
Iron bridge on change of plan at West street, Syracuse .....	10,000 00	6,320 00	9,100 00	900 00	
Inserting wrought-iron needle beams, etc., in bridge at Montezuma, Stephen's and Gutche's bridges, Port Byron, and bridge at Canaseraga .....	3,307 48	3,307 48	3,307 48	Settled.	
Furnishing materials for Butternut creek reservoir dam .....	.....	15,624 00	24,700 00	12,000 00	Contract of canal com'r.
Road at Butternut creek reservoir .....	5,413 91	5,413 91	5,413 91	.....	Contract of canal com'r.
Constructing 600 lineal feet vertical wall at Durhamville .....	3,971 01	3,971 01	3,971 01	Settled.	

Iron bridge on change of plan at New Boston.....	1,736 56	1,736 56	1,736 56	Settled.	Contract of canal com'r.
Protecting inner slope of the De Ruyter reservoir dam	.....	5,120 00	5,120 00	.....	.....
Rebuilding dam near Mill street, Cazenovia.....	6,140 00	2,360 00	2,360 00	3,780 00	Contract of canal com'r.
Repairs to dam at outlet of Owasco lake.....	1,500 00	840 00	800 00	660 00	.....
Vertical wall in cement between Clinton and Frank-	.....	.....	.....	.....	Contract of canal com'r.
lin streets, Syracuse.....	4,440 00	3,400 00	.....	1,040 00	.....
Rewooding Richmond and Crane brook aqueducts	.....	.....	.....	.....	Contract of superintend't.
on Montezuma level.....	16,050 90	16,050 90	16,050 90	Settled.	Contract of superintend't.
Feeder dam at Port Byron.....	6,686 54	6,686 54	6,686 54	.....	.....
Constructing 200 lineal feet of vertical wall at Weeds-	.....	.....	.....	.....	.....
port.....	1,441 00	.....	.....	1,441 00	.....
Constructing 300 lineal feet of vertical wall at Weeds-	.....	.....	.....	.....	.....
port, and 150 lineal feet at Port Byron.....	3,060 00	2,660 00	2,660 00	400 00	.....
Removing 125 chains bench-wall, and constructing	.....	.....	.....	.....	Contract of canal com'r.
slope-wall on towing-path side of Jordan level...	25,000 00	6,400 00	6,400 00	18,600 00	.....
Removing wall-benches and substituting slope-wall	.....	.....	.....	.....	.....
on towing-path side of Jordan level.....	38,000 00	.....	.....	38,000 00	.....
Totals.....	.....	\$104,150 42	.....	\$98,038 50	.....

<b>OSWEGO CANAL.</b>					
High dam, Oswego river.....	\$220,000 00	\$48,200 00	\$185,680 00	\$34,320 00	Contract of superintend't.
Deepening Oswego river.....	36,600 00	.....	.....	36,600 00	.....
Raising bank of Oswego canal.....	29,323 42	.....	29,323 42	Settled.	.....
Rebuilding docks on side cut at Salina.....	17,508 98	268 98	17,508 98	Settled.	.....
Iron bridge at Belgium.....	3,111 78	3,111 78	3,111 78	Settled.	.....
Rebuilding broken culvert at Oswego.....	6,000 00	.....	.....	6,000 00	.....
Filling and protecting berme bank below High dam..	7,500 00	5,200 00	5,200 00	2,300 00	.....
Totals.....	.....	\$56,780 76	.....	\$79,220 00	.....



TABLE No. 1 — (Continued).

CHARACTER OF WORK.	Estimat'd cost at contract prices.	Amount done during fiscal year.	Total amount done.	Amount re-maining to be done.	Remarks.
CAYUGA AND SENECA CANAL.					
Repairing, protecting and constructing extension of pier in river at Seneca Falls.	\$6,468 53	\$788 53	\$6,468 53	Settled.	
Removing bars from channel of Seneca river, between Cross lake and Montezuma.	48,840 00	.....	.....	\$48,840 00	
Stone abutments and pier at Dermont's.	1,911 64	1,911 64	1,911 64	Settled.	
Inserting wrought-iron needle beams in Free bridge.	919 25	919 25	919 25	Settled.	
Iron bridge with stone abutments at Evans street, Geneva.	5,100 00	3,080 00	3,080 00	2,020 00	
Vertical wall at Montezuma.	374 00	.....	.....	374 00	
Totals	.....	\$6,699 42	.....	\$51,234 00	
ITHACA INLET.					
Extending pier 200 feet and dredging harbor at Ithaca	\$12,494 68	\$1,054 68	\$12,494 68	Settled.	Contract of canal com'r.
Piling and dredging the harbor and inlet at head of Cayuga lake.	9,673 72	9,673 72	9,673 72	Settled.	
Totals	.....	\$10,728 40	.....	.....	
CHEMUNG CANAL.					
Raising and extending breakwater at Watkins.	\$21,835 00	\$7,095 00	\$21,835 00	.....	
Iron bridge in the village of Horseheads.	1,471 50	1,471 50	1,471 50	Settled.	
Totals	.....	\$8,566 50	.....	.....	

**CHENANGO CANAL.**

<b>CHEMANGO CANAL.</b>					
<b>Iron bridge at Genesee street, Greene.....</b>	<b>\$3,884 50</b>	.....	.....	<b>\$3,884 50</b>	<b>Canceled.</b>
<b>Swing bridge at Pleasant street, Hamilton .....</b>	<b>2,075 38</b>	.....	.....	<b>Settled.</b>	
<b>Swing bridge at State street, Sherburne .....</b>	<b>2,567 20</b>	.....	.....	<b>Settled.</b>	
<b>Madison brook reservoir dam.....</b>	<b>36,301 19</b>	.....	.....	<b>Settled.</b>	
<b>Swing bridge East Main street, Norwich.....</b>	<b>5,149 40</b>	.....	.....	<b>.....</b>	<b>Contract of superintend't.</b>
<b>Totals .....</b>	<b>.....</b>	<b>\$13,230 59</b>	.....	<b>\$3,884 50</b>	

TABLE No. 1—(Continued).  
*Statement showing amount appropriated, total amount done under old contracts, engineer's estimate of amount remaining to be done, and amount done during fiscal year, ending September 30, 1873.*

## ONEIDA LAKE CANAL.

CHARACTER OF WORK.	Amount Appropriated.	Amount done during fiscal year.	Total amount done under old contracts, now canceled.	Engineer's estimate of amount remaining to be done.
Section No. 1.....	} \$446,153 47 }	.....	\$37,960 00	\$15,500 00
Section No. 2.....		.....	61,494 20	.....
Section No. 3.....		.....	53,440 00	27,450 00
Section No. 4.....		.....	79,600 00	18,560 00
Section No. 5.....		\$600 00	115,540 00	18,490 00
Totals ...	\$446,153 47	\$600 00	\$348,034 20	\$80,000 00

TABLE No. 1 — (Continued).  
EXTENSION OF THE CHENANGO CANAL.

Leaseth of	CHARACTER OF WORK.	When let.	When to be completed.	Engineer's estimate.	Estimated cost at contract prices.	Amount done during fiscal year.	Total amount done.	Amount remaining to be done.	Remarks.
62	Section No. 1.....	June 22, 1865	Sept. 1, 1868	\$7,875 89	\$7,875 89	.....	\$7,875 89	.....	Canceled, October, 1867. •
63	River bank on T. P. section.....	July 29, 1868	April 1, 1870	14,690 00	16,711 93	.....	11,711 93	\$5,000 00	Change of plan.
71	Section No. 2.....	July 14, 1869	April 1, 1870	9,318 31	9,408 81	.....	9,408 81	.....	Canceled, October, 1867
80	Section No. 3.....	July 23, 1865	Sept. 1, 1868	29,086 37	29,086 37	.....	29,086 37	.....	Retest and completed; settled.
80	Section No. 3.....	July 23, 1865	Sept. 1, 1870	65,000 00	60,922 44	.....	60,922 44	.....	Canceled, October, 1867.
80	Section No. 3.....	July 23, 1865	Sept. 1, 1868	30,385 72	30,385 72	.....	30,385 72	.....	Canceled, October, 1869.
80	Section No. 4.....	July 23, 1865	Sept. 1, 1870	6,020 89	6,020 89	.....	6,020 89	.....	Canceled, October, 1867.
80	Section No. 4 and part of 3.....	July 23, 1865	Sept. 1, 1868	40,523 61	40,523 61	.....	40,523 61	.....	Completed and settled.
80	Section No. 5.....	July 23, 1865	Sept. 1, 1870	101,000 00	98,753 85	.....	98,753 85	.....	Completed and settled.
80	Section No. 5.....	July 23, 1865	Sept. 1, 1868	57,485 02	57,485 02	.....	57,485 02	.....	Completed, October, 1867.
80	Section No. 6.....	July 23, 1865	Sept. 1, 1870	39,227 81	39,227 81	.....	39,227 81	.....	Completed and settled.
80	Section No. 6.....	July 23, 1865	Sept. 1, 1868	10,563 89	10,563 89	.....	10,563 89	.....	Canceled, June, 1869.
80	Section No. 7 and part of 7.....	July 14, 1869	April 1, 1870	45,880 00	43,426 32	.....	43,426 32	.....	Completed and settled.
80	Section No. 8.....	June 23, 1865	Sept. 1, 1868	45,065 00	31,726 85	.....	31,726 85	.....	Completed and settled.
80	Section No. 8.....	June 23, 1865	Sept. 1, 1868	21,185 00	29,626 93	.....	29,626 93	.....	Completed and settled.
80	Section No. 9.....	June 23, 1865	Sept. 1, 1868	12,745 00	19,427 62	.....	19,427 62	.....	Completed and settled.
80	Section No. 10.....	June 23, 1865	Sept. 1, 1868	6,662 62	6,662 62	.....	6,662 62	.....	Canceled, October, 1867.
76	Section No. 11.....	July 29, 1868	April 1, 1870	13,100 00	15,556 20	.....	15,556 20	.....	Completed and settled.
80	Section No. 12.....	Feb. 7, 1866	Sept. 1, 1867	30,650 00	28,048 80	.....	28,048 80	.....	Completed and settled.
80	Section No. 13.....	Feb. 7, 1866	Sept. 1, 1867	17,050 00	18,040 86	.....	18,040 86	.....	Completed and settled.
80	Section No. 14.....	Feb. 7, 1866	Sept. 1, 1867	12,120 00	18,284 47	.....	18,284 47	.....	Completed and settled.
80	Section No. 15.....	Feb. 7, 1866	Sept. 1, 1867	13,080 16	13,080 16	.....	13,080 16	.....	Canceled, October, 1867.
80	Section No. 16.....	July 29, 1868	April 1, 1870	10,210 00	9,222 72	.....	9,222 72	.....	Completed and settled.
80	Section No. 17.....	Feb. 7, 1866	Sept. 1, 1867	9,008 86	9,008 86	.....	9,008 86	.....	Canceled, October, 1867.
80	Section No. 18.....	July 29, 1868	April 1, 1870	10,650 00	6,639 80	.....	6,639 80	.....	Completed and settled.
80	Section No. 19.....	Feb. 7, 1866	Sept. 1, 1867	22,650 00	13,455 68	.....	13,455 68	.....	Completed and settled.
80	Section No. 20.....	Feb. 7, 1866	Sept. 1, 1867	12,420 45	18,420 45	.....	18,420 45	.....	Canceled, October, 1867.
80	Section No. 21.....	July 29, 1868	April 1, 1870	25,700 00	13,940 98	.....	13,940 98	.....	Completed and settled.
80	Section No. 22.....	July 29, 1868	Sept. 1, 1870	26,311 34	26,311 34	.....	26,311 34	.....	Completed and settled.
80	Section No. 23.....	July 29, 1868	Sept. 1, 1870	46,098 00	46,098 00	.....	46,098 00	.....	Canceled, October, 1867.
80	Section No. 24.....	July 29, 1868	Sept. 1, 1870	10,650 00	11,280 50	.....	11,280 50	.....	Completed and settled.
80	Section No. 25.....	Feb. 7, 1866	Sept. 1, 1867	40,952 23	39,777 23	.....	39,777 23	.....	Completed and settled.
80	Section No. 26.....	Feb. 7, 1866	Sept. 1, 1867	10,820 46	10,820 46	.....	10,820 46	.....	Canceled, October, 1867.
80	Section No. 27.....	June 15, 1866	May 1, 1867	44,700 00	44,700 00	.....	44,700 00	.....	Completed and settled.
79	Section No. 28.....	June 15, 1866	May 1, 1867	65,100 00	76,271 88	.....	76,271 88	.....	Completed and settled.

TABLE No. 1 — (Continued).  
EXTENSION OF THE CHENANGO CANAL.

Length of chains.	CHARACTER OF WORK.	When let.	When to be completed.	Engineer's estimate.	Estimated cost at contract prices.	Amount done during fiscal year.	Total amount done.	Amount remaining to be done.	Remarks.
85	Section No. 23.	June 15, 1895	May 1, 1897	\$12,050 00	\$29,219 55	.....	\$29,219 55	.....	Completed and settled.
79	Section No. 24.	June 25, 1895	May 1, 1897	9,369 20	9,369 20	.....	9,369 20	.....	Canceled.
82	Section No. 25.	Nov. 11, 1899	Nov. 1, 1870	45,000 00	30,972 50	.....	30,972 50	.....	Relet.
84	Section No. 26.	June 15, 1895	Nov. 1, 1870	3,426 79	3,426 79	.....	3,426 79	.....	Canceled, October, 1897.
80	Section No. 27.	Nov. 11, 1899	Nov. 1, 1870	22,000 00	9,512 00	.....	9,512 00	.....	Relet.
85	Section No. 28.	June 25, 1895	Nov. 1, 1897	108,455 66	108,455 66	.....	108,455 66	.....	Canceled, October, 1897.
87	Sections Nos. 29 and 27.	Sept. 23, 1899	May 1, 1897	10,528 51	10,528 51	.....	10,528 51	.....	Canceled, October, 1897.
80	Section No. 29.	June 25, 1895	Nov. 1, 1870	73,000 00	64,402 00	.....	64,402 00	.....	Relet.
85	Section No. 30.	June 25, 1895	Nov. 1, 1897	16,700 00	16,700 00	.....	16,700 00	.....	Old contract.
87	Section No. 31.	June 25, 1895	Nov. 1, 1870	10,910 01	10,910 01	.....	10,910 01	.....	Canceled, October, 1897.
80	Sections Nos. 29 and 30.	Nov. 11, 1899	Nov. 1, 1897	5,005 28	5,005 28	.....	5,005 28	.....	Canceled, October, 1897.
80	Section No. 32.	Feb. 11, 1870	April 1, 1871	24,000 00	16,370 00	.....	16,370 00	.....	Relet.
80	Section No. 33.	Feb. 11, 1870	April 1, 1871	16,650 00	10,050 00	.....	10,050 00	.....	.....
80	Section No. 34.	Feb. 11, 1870	April 1, 1871	17,200 00	10,886 00	.....	10,886 00	.....	.....
80	Section No. 35.	Feb. 11, 1870	April 1, 1871	19,200 00	10,107 00	.....	10,107 00	.....	.....
80	Section No. 36.	Feb. 11, 1870	April 1, 1871	18,400 00	10,005 00	.....	10,005 00	.....	.....
80	Section No. 37.	Feb. 11, 1870	April 1, 1871	23,600 00	12,574 00	.....	12,574 00	.....	.....
115	Section No. 38.	Feb. 11, 1870	April 1, 1871	22,850 00	15,913 00	.....	15,913 00	.....	.....
136	Section No. 39.	Feb. 11, 1870	April 1, 1871	25,950 00	15,353 00	.....	15,353 00	.....	.....
..	Raising tow-path on sections 12, 13, 14, 22 and 23.	Feb. 11, 1870	April 1, 1871	80,725 00	59,198 00	.....	59,198 00	.....	.....
..	Lock No. 1.	July 14, 1899	Nov. 1, 1870	12,081 85	31,079 70	.....	31,079 70	.....	Canceled.
..	Lock No. 2.	June 22, 1895	Sept. 1, 1896	1,933 78	1,933 78	.....	1,933 78	.....	Canceled and abandoned.
..	Lock No. 3.	June 22, 1895	Sept. 1, 1896	2,376 90	2,376 90	.....	2,376 90	.....	Canceled.
..	Locks Nos. 1 and 3.	June 22, 1895	Sept. 1, 1896	1,772 50	1,772 50	.....	1,772 50	.....	Relet.
..	Lock No. 4.	Nov. 11, 1899	Nov. 1, 1897	31,730 00	35,094 00	.....	35,094 00	.....	Canceled, October, 1897.
..	Lock No. 5.	Feb. 7, 1896	Sept. 1, 1897	4,457 34	4,457 34	.....	4,457 34	.....	.....
..	Lock No. 6.	July 14, 1899	Nov. 1, 1870	13,000 00	11,058 58	.....	11,058 58	.....	.....
..	Locks Nos. 7 and 8.	Feb. 7, 1896	Sept. 1, 1897	12,995 00	13,879 16	.....	13,879 16	.....	.....
..	Chocanut aqueduct.	July 23, 1899	Nov. 1, 1870	20,000 00	23,879 00	.....	23,879 00	.....	.....
..	Tracy aqueduct.	Feb. 7, 1896	Sept. 1, 1897	17,007 16	17,007 16	.....	17,007 16	.....	Canceled, October, 1897.
..	Archibald aqueduct.	Nov. 11, 1899	Nov. 1, 1870	43,395 56	43,395 56	.....	43,395 56	.....	Completed and settled.
..	.....	.....	.....	35,980 34	35,980 34	.....	35,980 34	.....	Completed and settled.
..	.....	.....	.....	31,179 77	31,179 77	.....	31,179 77	.....	Completed and settled.
..	.....	.....	.....	15,000 00	9,097 00	.....	1,481 60	7,615 40	.....

[illegible]

TABLE NO. 2.

*Statement of work upon miscellaneous repairs and improvement under the supervision of the engineer department for the fiscal year ending September 30, 1873.*

CHARACTER OF WORK.	How authorized.	Appropriation or engineer estimate.	Amount done during fiscal year.	Amount paid and to be paid.
<b>ERIE CANAL.</b>				
Cleaning out culvert under the Oneida feeder, and lowering and widening ditch.....	By canal commissioner.....	\$1,303 34	\$1,303 34	\$1,303 34
Rebuilding bulk-head and gates at feeder-dam of the De Ruyter reservoir.....	By commissioner under repair contract.....	196 29	196 29	196 29
Butternut creek reservoir.....	By commissioner.....	58,625 88	58,625 88	58,625 88
Sewer under bridge-approach at Durhamville.....	By resolution of canal board.	794 00	794 00	794 00
Road bridge at Montezuma.....	By superintendent.....	769 20	769 20	769 20
Protecting banks on Montezuma level with brush and stone.....	By superintendent.....	1,212 45	1,212 45	1,212 45
Totals.....	.....	.....	\$62,901 16	.....
<b>OSWEGO CANAL.</b>				
Repairing breaches on Phenix and Horse-shoe dam levels, occasioned by freshet in spring of 1873.....	By commissioner.....	\$10,214 64	\$10,214 64	\$10,214 64
Repairing break in old abutment of High dam.....	By commissioner.....	5,879 34	5,879 34	5,879 34
Repairing breaks, dams at Baldwinsville and Oswego.....	By superintendent.....	.....	4,015 79	.....
Totals.....	.....	.....	\$20,109 77	.....

CAYUGA AND SENEGA CANAL.

Dredging harbor at Geneva.....	By commissioner, chap. 343, Laws of 1872.....	\$2,500 00	\$2,290 35	\$2,290 35
Totals.....		.....	\$2,290 35	.....

CHENANGO CANAL.

Repairing breaks at Gibson's, lock 4, and mouth of Glen creek..	By superintendent.....	\$7,067 51	\$7,067 51	\$7,067 51
Totals.....		.....	\$7,067 61	.....

CROOKED LAKE CANAL.

Repairs to bridge near Russell's Mill.....	Resolution of canal board, September 18, 1872.....	\$862 67	\$862 67	\$862 67
Totals.....		.....	\$862 67	.....

EXTENSION CHENANGO CANAL.

Bridges between Binghamton and Owego.....	By commissioner.....	\$4,034 31	\$4,034 31	\$4,034 31
Totals.....		.....	\$4,034 31	.....



## SUMMARY.

*Amount of work done during the fiscal year.*

CANAL.	Work under contract.	Work upon miscellaneous repairs.	Totals.
Erie.....	\$104,150 42	\$62,901 16	\$167,051 58
Oswego .....	56,780 76	20,109 77	76,890 53
Cayuga and Seneca.....	6,699 42	2,290 35	8,989 77
Chemung .....	8,566 50	7,067 51	15,634 01
Chenango.....	13,230 59	.....	13,230 59
Crooked Lake.....	.....	862 67	862 67
Oneida Lake.....	600 00	.....	600 00
Chenango extension.....	246 61	4,034 31	4,280 92
Ithaca inlet. ....	10,728 40	.....	10,728 40
Total.....	\$201,002 70	\$97,265 77	\$298,268 47

## WESTERN DIVISION.

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CANAL COMMISSIONERS' OFFICE, }  
ROCHESTER, *December 10, 1873.* }

The undersigned commissioner, in charge of the western division of the canals, presents the following as his annual report thereof, for the fiscal year ending September 30, 1873:

This division embraces that portion of the Erie canal extending from the east line of Wayne county to Buffalo.....	149 miles.
The Genesee valley canal, extending from Rochester to Olean.....	107 “
The extension of said canal from Olean to Mill Grove pond, on the Allegany river.....	6 “
And the Dansville branch, extending from the junction at Shakers to Dansville.....	11 “
Total length of main lines.....	<u>273 miles.</u>

There are also seventeen miles of feeders, three miles only of which are navigable, and three reservoirs, to wit; Rockville, Oil creek and Ischua, the latter being on the Genesee valley canal.

### ENGINEER DEPARTMENT.

J. F. Behn, division engineer, and Byron M. Hanks, resident, and their assistants, have had charge of this department of the service on this division during the past year, and are still in charge.

The duties of this department are to assist in the care, management and reparation of the canals, and, under the direction of the state engineer and surveyor, to make all surveys and estimates for work ordered by the legislature or canal board, prepare plans of same for adoption by said board and see that the work is well and properly done in accordance with such plans, and make monthly estimates for advances to contractors during its progress, and finals for same when fully completed; also, to make surveys and prepare maps for the hearing of claims before the canal

appraisers, and generally to render such other service as may be necessary in the line of their profession; and it affords me pleasure to bear testimony to the promptness and fidelity with which they have rendered me such assistance as I have required at their hands in the discharge of my official duties.

#### SUPPLY OF WATER.

This division of the Erie canal is supplied with water from lake Erie, through Black Rock harbor; from Tonawanda creek, at Pendleton; from Tonawanda and Oak Orchard creeks, at Medina; from the Genesee valley canal and Genesee river feeder at Rochester. The main supply is, however, obtained from lake Erie, and the source is ample for that purpose; but owing to the manner in which the canal has been constructed in that vicinity, connected as it is with Black Rock harbor, from which the mills of that vicinity also draw their water, it has been difficult to bring it to the guard-lock at lower Black Rock in sufficient quantities, under a reduced head, to at all times supply the canal east, and especially so in low stages of water in the lake; and navigation, in seasons heretofore, has been more or less interrupted in consequence. But the channel excavated last winter, from slip No. 3 to the broad waters of said harbor, has improved both the flow of water and navigation on that part of the canal, and fully-laden boats have been enabled to pass through the same at the lowest stages of water during the past season, but the difficulties to navigation will not be wholly obviated until the canal is completed on the plan adopted of making it entirely separate and independent of the harbor, and which, if means are provided for that purpose, may be accomplished in the course of the coming year. The water which passes in mill-races, around the locks at Lockport, is used under a perpetual lease from the state, and after such use is again discharged into the canal below said locks; such use, to the extent required for feeding the canal east thereof, is no more detrimental to navigation than if the same amount was passed without such use. But when used in excess of such requirements, an increase of velocity is occasioned proportional to such excess, which may, and does, at times, prove unfavorable to navigation. Under the present state of things, the only remedy as against an excess of use by the mills is the care and watchfulness that may be exercised by the agents of the state in charge of the locks and feed-gates at that place, in so controlling it from day to day during the season of navigation as will best subserve the public interest, by

maintaining the levels both above and below said locks at the requisite height for the most favorable navigation, all things considered, on the plan of canal as the same now is and has been constructed in that vicinity.

The Genesee valley canal is supplied with water from the following sources: Allen's creek, at Scottsville; Genesee river, at Mount Morris; Canaseraga creek, at Woodville; Mill creek, at Dansville; Wiscoy creek, at Mixville; Genesee river feeder, at Oramel; Rockville reservoir, at Rockville; Oil creek reservoir at Cadysville; Champlain and Griffin's creeks, at Cuba; Ischua feeder, near south end of summit; Oil creek feeder, near Hinsdale; Dodge and Haskell creeks and the Allegany river, on the extension, between Olean and Mill Grove pond.

The present sources of supply are deemed ample for all parts of said canal, except the southern two miles of the Dansville branch which has not at all times a sufficiency of water.

Act chapter 850, Laws of 1872, appropriated \$10,000 to convey the water of Loon lake into Mill creek, and thence into said branch by the feeder at Dansville, to supply such deficiency, but the canal board has not as yet approved of the plans and estimates for such work, and the same has not been put under contract.

#### APPOINTMENT OF SUPERINTENDENTS, AND GENERAL CONDITION OF NAVIGATION.

There are eight superintendent's sections on this division, to wit: Nos. 10, 11, 12, 13 and 14, on the Erie, and Nos. 1, 2 and 3, on the Genesee valley canal.

At a meeting of the canal board, on the 29th of January, 1873, the following persons were appointed superintendents, and assigned in charge of the sections as stated below, to take effect on and after February 1st, proximo:

A. P. Warren, Lyons.....	Section 10, Erie canal.
H. P. Wilbur, Fairport....	" 11, "
Waldo Joslyn, Albion.....	" 12, "
W. W. Butrick.....	" 13, "
D. Clinton Welch, Buffalo.....	" 14, "
R. A. Kneeland, Geneseo.....	" 1, G. V. canal.
Elijah Young, Nunda.....	" 2, " "
W. H. Withey, Cuba.....	" 3, " "

The above-named superintendents entered upon the service, and are still in charge of the sections then respectively assigned them.

By resolution of the board of canal commissioners the canals were to be opened for navigation on the 15th day of May last, a day somewhat later than usual, owing to the amount of work then in progress, and which could not be got in readiness before that time, in consequence of the backwardness of the season.

This division was opened at the time appointed, except sections 2 and 3 of the Genesee valley canal, which were delayed, by the slide at Portage and other work, until about the 20th of May, before boats could pass over them.

Navigation generally has been good, both on the Genesee valley and Erie canals, and but slightly interrupted by breaks or other causes. Boats with full cargoes have moved with much facility and regularity as evidenced by the large business done during so short a season's navigation as the last has been, the canals having opened late, and substantially closed for all business purposes, by the frosts of the 25th of November last, thus shortening the actual shipping season comparatively some three weeks.

## REPAIRS OF ERIE CANAL.

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### REPAIR SECTION No. 10.

A. P. WARREN, SUPERINTENDENT.

This section is 35 miles in length, extending from the east to the west line of Wayne county, and has been in charge of A. P. Warren, as superintendent, during the fiscal year.

The mechanical structures on this section are as follows: Six double and three single lift locks, fourteen iron-truss road bridges, eighteen wood road, two wood road and change, one wood farm and change, and eight wood farm bridges, four waste-weirs, three composite and nineteen stone culverts, two cast-iron pipe culverts, two wooden trunk aqueducts, eight lock and nine watch houses, and one receiver.

The work of doubling lock Berlin and Poor-house locks has been completed and the structures were brought into use at the opening of navigation last spring. Heath's tumble gate and platform have been inserted in the old Poor-house and lower Macedon locks, materially increasing their capacity for lockage, and effecting a considerable saving of water.

The waste-weir on the lock Berlin level has been rebuilt at a new location, and the wood road bridge at the foot of the middle lock at Lockville has been replaced with an iron superstructure.

The foregoing work has all been done by contract.

The state shop and timber shed located at Palmyra, together with their contents, were destroyed by fire on the night of February 21st, last, which entailed a loss of about \$6,500 upon the state, there having been no insurance upon the property. These structures should be rebuilt at an early day.

Detentions have occurred as follows: June 1st, from a sunken light boat, three hours; June 9th, from sunken boat loaded with wheat, twelve hours; August 13th and September 14th from same cause, respectively three and six hours, and September 28th from sunken boat loaded with stone, five hours. Eighteen hours' deten-

tion has occurred at different times during the season from unshipping lock-gates.. No other detentions have occurred during the year.

Repairs have been made to the following-named locks:

Upper and lower Macedon, by renewing miter-sills and repairing planking to foundation, and to Poor-house and Middle Lockville locks, by resetting coping at head, total cost of which was.....	\$331 25
Lock-tending has cost .....	6,129 17
Oil for locks .....	76 74
Seven new lock-gates have been framed complete, and nine others in part, and the nine have been inserted, costing the sum of.....	2,413 95
Most of the old lock-gates upon the section have been repaired by putting on new fender plank, connecting rods, valves and other irons where needed, at a cost of .....	1,770 69
The aqueducts at Palmyra and Lyons have received repairs to trunks, consisting of replanking bottom and sides, putting on new plates to Lyons, and strengthening sides of the Palmyra aqueducts at a cost of .....	213 80
The waste-weir near Clyde lock has been replanked, costing.....	22 91
The covering to the composite culvert at the foot of Poor-house lock had been washed off by action of swells from the lock, causing it to leak badly. Before the opening of navigation, last spring, the pit was pumped out, new covering timbers put on, and the whole thoroughly concreted, the total cost of which was.....	462 49
Seven of the wood farm bridges have received repairs to their roadways, at a cost of.....	194 45
Nearly all the wood road bridges upon the section have received repairs to roadways, consisting of new planking and joists, at a cost of.....	487 43
The iron road bridges in Clyde, Lyons, Newark and Macedon have been painted and received repairs to planking and roadway, costing.....	463 14
The wood towing-path bridges have received repairs to roadway and railing, at a cost of.....	109 57
State scows have been repaired, repainted and refurnished, at an expense of .....	272 24

One new ice-breaker has been built and repaired, at an expense of.....	\$632 47
The several watch-houses have been repaired by putting down new flooring, ceiling, windows, doors, etc., costing.....	70 37
The towing-path and berme banks on the entire section have received more or less repairs, a large amount of graveling has been done on the Clyde and Palmyra levels, the whole costing the sum of..	7,312 26
Bottoming out was done on nearly every level upon the section at points most needed, costing the sum of.....	3,767 07
Slope-walls were repaired on the Wayneport, Palmyra and Poor-house levels, costing the sum of.....	139 50
Docking on top of vertical walls through the villages of Clyde and Palmyra has been renewed, and other points repaired at an expense of.....	1,541 24
There was expended last fall in breaking ice and assisting boats in consequence of same, the sum of.....	286 52
For watching canal, the sum of.....	16 50
For new tools, wheelbarrows, and repairs of old, the sum of.....	600 14
Three new foot bridges have been built for locks Nos. 60 and 61, costing.....	144 52
A new pier has been constructed at head of lock No. 61, and the piers at Lyons and upper Lockville locks have been repaired, the whole costing the sum of..	229 58
A new spillway has been constructed around lower Macedon lock, costing.....	326 79
A large number of new snubbing-posts have been furnished and set at different points upon the section, costing the sum of.....	143 50
There has been expended for clerk hire, rent of office and workshop, for fuel, stationery, postage and other miscellaneous matters, the sum of.....	1,788 09
For rebuilding abutments and repairing protection walls along the discharge ditch from Newark waste-weir, the sum of.....	194 65

*Summary of Expenditures.*

Expended by superintendent for new work.....	\$5,170 61
Expended by superintendent for ordinary repairs....	24,079 42



Superintendent's salary.....	\$1,500 00
Clerk hire.....	900 00
	<hr/>
	\$31,650 03
	<hr/>

## REPAIR SECTION No. 11.

HIRAM P. WILBUR, SUPERINTENDENT.

This section is 40 miles in length, extending from the east line of Monroe county, to the west end of construction section No. 284, in the village of Brockport, and includes the Genesee river feeder and the structures connected therewith, and the towing-path bridge over the Genesee Valley canal at its junction with the Erie.

From the commencement of the fiscal year up to February 1st, the section was in charge of C. W. Palmer, as superintendent; since that date it has been in charge of the present incumbent.

The mechanical structures on this section are as follows: Two double and three single lift-locks, one weigh-lock, four stop-gates, one stop-dam, one Genesee river aqueduct, eight waste-weirs, one overflow spillway two cast-iron pipe culverts, thirty-nine stone and composite culverts, one wood farm, twenty-nine wood road, one wood towing-path change, one iron towing-path change, one iron towing-path, two iron swing and thirty iron road bridges, three lock and five watch-houses, one workshop, one timber-shed, one store-house and one dam and bulk-head.

The doubling of the Pittsford lock and lock No. 1, east of Rochester, had been completed, and they were brought into use last spring.

Two new iron road bridges, with their abutments, have been built at new locations and brought into use during the fiscal year; also, one iron road bridge superstructure has been substituted for wood. The composite culvert on the three-mile level has been rebuilt, substituting cast-iron pipes for the wooden trunks formerly in use. The foregoing work has all been done by contract.

The several locks upon the section were thoroughly repaired before the opening of navigation, which, together with some minor repairs, made during the season, has cost the sum of.....

Lock-tending has cost the sum of.....	\$820 56
There has been expended for lighting locks.....	5,371 01
Several new lock-gates have been made and inserted, at a cost of....	136 97
	516 85

Nearly all the old gates not removed have received more or less repairs, costing the sum of.....	\$1,458 70
There has been expended in repairing the railing, and in replanking the towing-path to Genesee river aqueduct, the sum of.....	100 73
The several waste-weirs at Fairport, Cartersville, in the aqueduct at Rochester, at Spencerport, Adam's Basin and Brockport have been repaired by renewing timber-work, relaying masonry and repairing irons, at a cost of.....	747 34
Extensive repairs have been made to the weigh-lock, consisting of renewing the timber in cradle, putting in new suspension rods and turn-buckles, new chains and other irons for gates; also, in repairing and re-adjusting scales, the total cost of which is...	648 90
A number of culverts have received needed repairs, at a cost of.....	408 98
The berme abutment of the road bridge at Cooley's Basin having failed from having been improperly constructed, it became necessary to rebuild it from the foundation, together with a portion of the retaining walls connected therewith; this work, together with the erection of a new superstructure, cost the sum of.....	2,007 96
The wood road bridges at Knappville and Webster's (west) have been built new, costing.....	1,164 60
Nearly all of the wood bridges upon the section have received more or less repairs, consisting of new needle beams, floor timbers, planking and painting, costing the sum of.....	2,126 12
Several of the iron bridges have been replanked, and have received other needed repairs at a cost of....	3,454 00
The iron truss which supports the east sidewalk of Fitzhugh street bridge, Rochester, was struck by a light boat, and being carried from its bearings fell into the canal, breaking the castings, and rendering them unfit for use. A new trap was procured, the whole superstructure raised six inches, and the sidewalk replanked, costing the sum of.....	525 79
There has been expended in repairs to towing-path bridges the sum of.....	137 53

The swing bridge on Exchange street, in the city of Rochester, has been replanked, a new center-pin procured and inserted, and other portions of the gearing removed.

The towing-path swing bridge over Child's slip has been replanked, and some repairs have been made to the irons, which, together with the expense of operating both bridges, has amounted to the sum of **\$1,267 02**

There has been expended in raising and repairing the towing-path and berme banks upon the whole section, the sum of..... **5,666 59**

Bottoming out was done at various points most needed upon the section, for which there was expended the sum of..... **2,135 26**

During the spring freshet, last April, Thomas creek broke into the canal through the berme bank at a point on the Perrinton straits, about one-half mile east of Knappville.

The breach was about 120 feet in length by 11 feet in depth; the material from which, together with a large amount of debris from the bed of the stream, was carried into the prism. The removal of this material, together with the closing of the breach, and the construction of the necessary dams, cost the sum of..... **3,535 18**

The timber and plank facing upon the berme side of the prism, over the Irondequoit embankment, which had become badly decayed, has been removed, at a cost of..... **1,265 10**

There has been expended in taking down, rebuilding and repairing slope and vertical walls, and for renewing docking on same, the sum of..... **5,659 21**

There has been expended in watching banks and structures, and for regulating water, the sum of... **1,781 25**

During the flood in the Genesee river last spring the waters backed up through the culverts forming the waste-weir discharge near the weigh-lock, and forced out the gates and overflow walls, entirely demolishing them. In reconstructing this work the gates were left out, and an overflow or spillway constructed instead, at a cost of..... **1,227 01**

Three new watch-houses have been built at locks Nos. 64, 65 and 66, and repairs have been made to others, the whole costing the sum of.....	\$532 48
New piers have been built at the Adams' basin stop-gate, and a portion of the masonry relaid; this, with repairs to Deep Hollow and Cartersville gates, together with the expense of keeping lights at the Deep Hollow and Adams' basin gates, cost the sum of.....	894 53
During the flood of last spring a portion of the Genesee River feeder dam was carried away, and several breaches were made in the feeder banks, and there has been expended in repairs of same the sum of.....	970 81
Breaking ice, and assisting boats in consequence of same, has cost the sum of.....	969 66
There has been expended for new tools and wheelbarrows, and for repairs of old, the sum of.....	589 95
There was expended in building a flume or spillway around lock No. 65, to feed the levels below, the sum of.....	523 61
There has been expended for repairs of state scows, ice-breakers, lock-houses and work-shops, and for setting snubbing-posts, assisting sunken boats, and for other miscellaneous matters the sum of.....	<u>2,693 19</u>

There have been no detentions, upon this section during the season, except from low water on the level between Rochester and Lockport, occasioned by the breaks at Eagle harbor waste-weir, and Shelby basin, which detention lasted for nine days.

The following-named work should be done before the opening of navigation next spring:

The berme abutment of Doty's bridge is in danger of falling, and will require rebuilding.

The banks of the Genesee River feeder will require strengthening at several points, and the feeder-dam should receive additional repairs to secure the work done during the past season.

The bulk-head to the weigh-lock flume is badly decayed, and will require renewing entire, also the timber and plank covering to the discharge-way.

The upper miter-sill of lock No. 64, will require renewing, and the miter-sill wall should be relaid.

*Summary of Expenditures.*

Expended by superintendent for new work or structures .....	\$5,355 30
Expended by superintendent for ordinary repairs....	43,981 68
Superintendent's salary paid C. W. Palmer.....	500 00
Superintendent's salary paid H. P. Wilbur.....	1,000 00
Clerk hire.....	900 00
	<hr/>
	\$51,736 98
	<hr/>

## REPAIR SECTION No. 12.

## WALDO JOSLYN, SUPERINTENDENT.

This section extends from the west end of construction section No. 284 (in Brockport) to the west line of Orleans county, including Oak Orchard feeder, is 30 miles in length, and has been in charge of Waldo Joslyn, as superintendent, during the fiscal year.

The mechanical structures on this section are as follows: One wrought-iron swing, fourteen iron road, eighteen wood road and three wood farm, bridges; six waste-weirs, forty-three culverts, one aqueduct, two stop-gates, two bulk-heads and one dam.

The aqueduct over Oak Orchard creek, at Medina, has received some repairs, at a cost of.....	\$88 20
Some repairs have been made to the wood work of the several waste-weirs, costing the sum of.....	60 38
Two wood road bridges, viz., Beal's and County Line, have been built new; the one at Shelby Basin has been partially rebuilt, by putting on new braces, straining beams, wall plates and corbles. Several others have received repairs to road-way, planking, and three have been painted, the whole costing the sum of.....	2,502 90
The iron bridges at Knowlesville and on Ingersoll street, Albion, have been painted, at a cost of.....	85 36
The state scows have received needed repairs and painting, at a cost of.....	231 55
A large amount of towing-path has been raised and graded, and back ditches have been constructed, to carry off surface water, at an expense of.....	5,603 42
But little bottoming out was needed or done; amount expended for this work was.....	394 00

During spring repairs a large amount of slope and vertical wall at different points on the section was taken up and relaid, requiring a considerable quantity of new stone to be furnished. Some 800 lineal feet of the timber and plank facing on the towing-path side of the embankment, over Fisk creek culvert was renewed and slope-wall substituted, the whole costing the sum of.....	\$4,569 23
A considerable quantity of docking top of vertical walls has been removed and repaired, principally through the large villages, at a cost of.....	1,550 64
Two breaches have occurred upon this section during the fiscal year. The first occurred on the morning of August 2d, at Shelby Basin, which was occasioned by the giving way of a culvert at that point; the second occurred on the morning of August 12th, at Eagle Harbor waste-weir, by which the waste-gates masonry, forming the abutments, a portion of the weir and considerable of the contiguous bank was carried out. Temporary repairs were made in both instances, the cost of which was.....	6,913 99
There has been expended in breaking ice and assisting boats in consequence of same, the sum of.....	737 90
For watching canal and tending waste-weirs and other structures, the sum of.....	1,636 00
For new wheel-barrows and tools, including repairs to old, the sum of.....	436 17
The stop-gate east of Holley was repaired by removing the timber cribs at both ends of center pier; this, together with other needed repairs to the same structures, and to the one at Fish creek culvert, cost the sum of.....	861 82
There has been expended for tending the swing bridge at Albion, for cutting thistles and noxious weeds, and for other miscellaneous matters, the sum of.....	3,622 40

The detentions occasioned by the breaks at Eagle harbor and Shelby basin were four days each, aside from these, there have been no other detentions.

The following-named work should be done before the opening of navigation next spring.

The waste-gates and weir at Eagle harbor and the culvert at Shelby basin, destroyed by the breaches heretofore mentioned, should be rebuilt. The culvert just west of Albion, which is now closed, should be overhauled, and, if found necessary, rebuilt.

The timber and plank-facing on the Holley embankment, which is decayed, will require removing, or should be replaced with a substantial slope-wall.

*Summary of Expenditures.*

Expended by superintendent for new work or structures,	\$5,118 13
Expended by superintendent for ordinary repairs.....	24,175 83
Superintendent's salary.....	1,500 00
Clerk hire.....	900 00
	<u>\$31,693 96</u>

REPAIR SECTION No. 13.

W. W. BUTTRICK, SUPERINTENDENT.

This section is 26 miles in length, extending from the east line of Niagara county to Pickard's bridge, on Tonawanda creek, and has been in charge of W. W. Buttrick, as superintendent, during the fiscal year.

The mechanical structures on the section are as follows: Five double combined lift-locks, one guard-lock, one state-race and two bulk-heads, one stop-gate, twenty-three culverts, four waste-weirs, fifteen wood road, fifteen iron road, one wood farm, one iron towing-path change and four wood towing-path change bridges, one lock and tool-house, one workshop and one timber-shed.

The combined locks at Lockport were thoroughly repaired last spring before the opening of navigation, by taking out, repairing and resetting culvert valves, repairing and renewing miter-sills, relining lock bottoms, taking up and relaying old coping, furnishing and laying some new coping, rebuilding timber pier at head of locks, pointing up masonry in lock walls, together with other needed repairs, for which there was expended the sum of.....	\$3,146 54
The guard-lock at Sulphur Springs received slight repairs, costing the sum of.....	18 70
Lock-tending has cost the sum of.....	6,552 67

Lighting locks with gas cost.....	\$758 40
Two new lock-gates were made and inserted, all the old ones receiving more or less repairs, consisting of new balance beams, miter-posts, fenders, levers, valves, and some planking, the whole of which cost the sum of	1,063 34
The timber work to the waste-weirs at Jackson's, Johnson's creek and Middleport has been renewed at a cost of.....	214 51
Two new wood road bridges have been built: one at Wakeman's and one over the old canal at Pendleton, which cost the sum of.....	1,052 26
Several of the wood road bridges have been repaired by putting in new floor timbers and needle beams, replanking roadway and painting trusses, at a cost of	1,106 43
The iron road bridges on Pine, Comstock, Adams, Chapel and Mill streets, in the city of Lockport, at Middleport, Youngs and Reynales basin received repairs to roadway, consisting of new floor timbers and planking which, together with painting, cost the sum of.....	1,110 18
State scows, Nos. 1 and 2, were docked and repaired at an expense of.....	195 69
Repairs to ice-breaker cost.....	78 38
There was expended in repairs of lock-houses at Lockport the sum of.....	27 25
There has been expended in raising and repairing the towing-path and berme banks upon the whole section, including a considerable amount of rip-rap placed upon the rear of berme bank, near Millard's bridge, the sum of.....	4,840 13
Considerable bottoming-out was done upon the section last spring, principally at head and foot of locks at Lockport, which cost the sum of.....	1,653 08
Slope and vertical walls were taken up and relaid at various points upon the section, at an expense of....	1,376 63
The freshet in Tonawanda creek, last spring, washed off a large amount of docking timber from the towing-path side of the canal, and damaged much more. There has been expended in replacing that washed off with new, and repairing the old, together with renewing some at other points upon the section, the sum of.....	3,191 44



Breaking ice and assisting boats in consequence of same, has cost the sum of.....	\$539 11
There has been expended for watching canal, regulating water in state race at Lockport, and for taking care of flood-wood and ice at head of combined locks, the sum of.....	1,694 00
For new tools and wheelbarrows, including repairs to old, the sum of.....	329 65
For mowing thistles, setting snubbing posts, publishing abstracts, rent of office, and for other miscellaneous matters, the sum of.....	516 21
<hr/>	
There has been no detention upon this section, except that caused by the breaks upon Repair section, No. 12, amounting in the aggregate to five days.	

*Summary of Expenditures.*

Expended by superintendent for new work or structures .....	\$941 26
Expended by superintendent for ordinary repairs.....	28,533 34
Superintendent's salary.....	1,500 00
Clerk hire.....	900 00
<hr/>	
\$31,874 60	
<hr/>	

### REPAIR SECTION, NO. 14.

D. CLINTON WELCH, SUPERINTENDENT.

This section is nineteen miles in length, extending from Pickard's bridge on Tonawanda creek to the city of Buffalo, including the Main and Hamburg street and Clark and Skinner canals, Erie and Ohio basins, with their slips, and Black Rock harbor, and has been in charge of D. Clinton Welch as superintendent, during the fiscal year.

The mechanical structures on the section are as follows: One ship-lock, one river lift-lock, one double guard-lock with feed gates, twenty iron road bridges with iron needle-beams, five iron road bridges with wood needle-beams, six wood road and farm, two iron swing, two wood draw, three iron and one wood and iron change, one iron lift and four wood towing-path bridges, three culverts, two spillways, one draw and bulk-head, one Erie basin break-water, one Black Rock pier, one stone jetty-pier at entrance of Erie basin, and one pile jetty-pier at entrance of Black Rock harbor.

The repairs of wood and iron work of locks, together with the removal of flood-wood and stone from gates and the necessary oil for the working of the locks, has cost the sum of.....	\$1,393 19
Lock-tending has cost the sum of.....	2,525 77
A new wrought-iron bridge has been erected over the canal on Washington street, in the city of Buffalo, in place of one that fell, which, together with repairs to most of the other bridges on the section, have cost the sum of.....	10,420 78
The tending of the several swing-bridges in the city of Buffalo has cost the sum of.....	895 67
Two new dump-scows have been built for the dredges, which, together with repairs to the several state scows, steam-tug and dredges belonging to the state, has cost the sum of.....	12,951 05
The lock-house at the guard-lock, at Black Rock, has been thoroughly repaired, costing the sum of.....	236 84
A number of piles were driven on construction section, No. 368, and at the guard-lock, at Black Rock, to secure the towing-path, which cost the sum of.....	417 16
There has been expended in raising and repairing the towing-path and berme banks extending over the whole section, the sum of.....	7,964 08
Dredging out deposit in the canal, and cleaning out under bridges in the city of Buffalo, has cost the sum of	9,901 91
One abutment of the Amherst street bridge failed, and it became necessary to rebuild it from the foundation; this, together with repairs to the Washington street abutments and to vertical walls through the city of Buffalo, cost the sum of .....	3,538 35
The dam at Tonawanda has received needed repairs, at a cost of.....	297 64
A large amount of docking has been renewed and repaired, costing.....	5,397 02
Breaking ice and assisting boats in consequence of same, cost .....	374 40
Watching canal and regulating water at Black Rock cost the sum of.....	640 00
There has been expended for new tools, repairs of old, and for other miscellaneous matters, the sum of ....	2,307 50

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No detentions have occurred upon this section during the fiscal year.

*Summary of Expenditures.*

Expended by superintendent for new work or structures,	\$13,785 75
Expended by superintendent for ordinary repairs.....	45,481 81
Superintendent's salary.....	1,500 00
Clerk hire .....	900 00
	<hr/>
	\$61,667 56

## REPAIRS OF GENESEE VALLEY CANAL.

### REPAIR SECTION No. 1.

R. A. KNEELAND, SUPERINTENDENT.

This section is 52 miles in length, extending from the junction with the Erie canal at Rochester to the terminus of the side-cut at Dansville, including the feeders at Scottsville, Woodville and Dansville, and has been in charge of R. A. Kneeland as superintendent during the fiscal year.

The mechanical structures on the section are as follows: Nineteen lift-locks, one guard-lock, four dams, three bulk-heads, eight aqueducts, seven waste-weirs, fifty-six culverts, fifty-four wood farm, one wood farm and change, thirty-one wood road, two wood road and change, two wood towing-path, and eleven iron road bridges, thirteen lock-houses and one workshop.

Boats navigating this canal have experienced much trouble and delay in past seasons occasioned by wedging in the chamber of lock No. 6, the walls of which were constructed with a big bevel near the bottom. This difficulty was removed before the opening of navigation last spring, by putting in coffer-dams, bailing the chamber and cutting out the bevel.

Several breaches occurred before the opening of navigation in the towing-path and berme banks on the four and eight-mile levels during the freshet of last spring. Large bars were also formed in the prism at various points upon the section, especially on the Dansville side-cut, which added largely to the expense of bottoming out-

Three small breaches occurred upon the section during the season of navigation ; one at Sacket's, on the two-mile level, one at Simmons', on eight-mile level, and one over the culvert at Sonyea, on the twelve-mile level. All were soon repaired and caused but a few hours detention.

There has been expended in general repairs to gates, miter-sills, valves and foundations to the several locks upon the section, together with cutting out the bevel of lock No. 6, the sum of.....	\$2,481 80
Lock-tending has cost the sum of .....	2,545 99
Oil for lock has cost the sum of .....	7 50
Several new lock-gates have been made and inserted, at a cost of.....	1,364 80

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A large amount of work has been done at the Shaker aqueduct in protecting and securing the piers with brush and stone.

The aqueducts at Scottsville, Baird's Creek, Buck Run, Hartman's, Rock Spring and Canaseraga have received general repairs to trunks, the whole of which has cost the sum of.....	\$2,045 98
The waste-weirs on the eight-mile level and at Little Black creek have been repaired and cleaned out, at an expense of .....	118 50
The diving culvert near Canawaugus, on the eight-mile level, has been taken up and rebuilt, which, with repairs and cleaning out of the several culverts on the one and six-mile levels, has cost the sum of ....	1,151 08
Five new wood farm bridges have been erected and several others have been framed, at a cost of.....	2,761 04
All other wood farm bridges on the section have received general repairs, consisting of new needle-beams, floor timbers and planking, and several have been partially rebuilt, costing the sum of.....	2,797 12
New wood road bridges have been erected at Jones', Spencer's, Piffardinia and Moscow Landing, and several others have been framed, costing the sum of...	2,270 03
Most of the others have received general repairs to approaches and roadways, at a cost of.....	999 58
The iron bridge over the canal on West Main street, in the city of Rochester, has received extensive repairs,	

consisting of putting in new floor timbers and replanking; this, together with general repairs to the several iron bridges in Rochester and Mt. Morris, has cost the sum of.....	\$1,536 30
The several wood towing-path and change bridges upon the section have received general repairs, costing...	661 62
There has been expended in repairing and repainting the state scows, the sum of.....	320 46
One small boat has been purchased and repaired, at a cost of.....	56 08
Repairs to ice-breaker have cost.....	31 50
Repairs have been made to the several lock-houses at locks Nos. 2, 3, 4, 5 and 6, and at No. 2 a cellar has been excavated and the house underpinned with a substantial wall, the whole costing the sum of.....	411 17
There has been expended for rent of and repairs to work-shops, the sum of.....	247 75
A large amount of work has been done in raising and repairing towing-path and berme banks, and in securing slides in towing-path bank, for which there has been expended the sum of.....	4,465 40
There has been expended in bottoming out, including removing bars from prism of canal washed in by the spring freshet, in scraping out channel at the Genesee river crossing, and in Mill Creek feeder at Dansville, the sum of.....	4,941 10
The dams in Genesee river at Mt. Morris, and in Mill Creek at Dansville, have been secured with brush and stone at a cost of.....	123 50
There has been expended in rebuilding and repairing vertical walls in the city of Rochester the sum of...	425 84
The docking on top of vertical walls in the city of Rochester at foot of lock No. 7, and in Genesee river at Mt. Morris, has been repaired at a cost of.....	152 46
The repairs of the several breaches heretofore mentioned cost the sum of.....	1,623 59
There was expended for breaking ice and assisting boats in consequence of same, the sum of.....	931 75
For watching canal and regulating water, the sum of..	617 81
For new wheelbarrows and tools, and for repairs of old, the sum of.....	170 05

For cleaning out back ditches at various points, particularly upon the eight-mile level, the sum of.....	\$704 25
For other miscellaneous matters, the sum of.....	2,144 95

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*Summary of Expenditures.*

Expended by superintendent for new work or structures.....	\$6,620 99
Expended by superintendent for ordinary repairs.....	31,488 01
Superintendent's salary.....	1,500 00
Clerk hire.....	900 00
	<hr/>
	\$40,509 00

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## REPAIR SECTION No. 2.

ELIJAH YOUNG, SUPERINTENDENT.

This section is 36 miles in length, extending from the junction at the Shaker settlement to and including the Genesee river feeder at Oramel. It also includes the Wiscoy feeder at Mixville, and has been in charge of Elijah Young, as superintendent, during the fiscal year.

The mechanical structures upon the section are as follows: Sixty-one lift-locks, one guard-lock, one dam and bulk-head, seven aqueducts, one wooden trunk, thirty culverts, nine waste-weirs, thirty-two wood road, three iron road, twenty-eight wood farm and four wood towing-path bridges, one overflow spillway, twenty-one lock, and sixteen watch, houses and one workshop.

As has been the case for several years past, during the thaws of winter and spring, large quantities of quicksand and clay have run into the prism of the canal at the location of the Portage slide, filling the channel to a depth of four feet.

The removal of this material is necessarily expensive, as it has to be loaded in cars, run from ten to 30 rods and thrown over the precipice into the river. This work caused a delay of some two weeks in the opening of navigation last spring.

During the suspension of navigation last winter and spring, the old part of the Portage aqueduct trunk was rebuilt, as was also one span of the Caneadea aqueduct.

The spring flood in the Genesee river carried away 150 feet of the state bridge over the river at Fillmore, including one pier and ice-breaker.

There has been expended in repairs of locks, inserting new miter-sills, etc., the sum of.....	\$299 80
Lock-tending has cost the sum of.....	8,907 58
Twenty-five new lock-gates have been made and inserted, which, with extensive repairs to the old ones, have cost the sum of.....	4,430 55
The rebuilding of the Portage and Caneadea aqueduct trunks cost the sum of.....	6,106 66
Repairs to waste-weirs and culverts, the sum of.....	118 33
Five new wood bridges have been erected, which, with extensive repairs to the old ones and the rebuilding of that portion of the river bridge at Fillmore, carried away by the spring floods, have cost the sum of.....	4,921 84
The state scows have received needed repairs, at a cost of,	78 08
There has been expended in raising and repairing towing-path and berme banks, at various points upon the section, the sum of.....	2,327 18
In cleaning out bottom of canal during spring repairs, including the removal of material at the Portage slide, the sum of.....	3,751 78
Previous to the opening of navigation last spring, the flood waters of the Cashuqua creek caused extensive damage to the towing-path bank between the Shaker settlement and lock No. 11; the bank was entirely washed out for a distance of about 400 feet, and was badly damaged for a further distance of 300 feet. The repairs of this breach, together with the putting on of necessary protection to secure it in the future, cost the sum of.....	4,442 03
Watching canal and regulating water, cost the sum of,	1,168 94
There was expended for new wheelbarrows and tools, and for repairs of old, the sum of.....	148 95
For breaking ice and assisting boats in consequence of same, and for other miscellaneous matters, the sum of,	2,564 19

*Summary of Expenditures.*

Expended by superintendent for new work or structures.....	4,065 83
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Expended by superintendent for ordinary repairs.....	\$35,293 08
Superintendent's salary.....	1,500 00
Clerk hire.....	900 00
	<hr/>
	\$41,758 91
	<hr/>

## REPAIR SECTION No. 3.

W. H. WITHEY, SUPERINTENDENT.

This section is 37 miles in length, extending from the south bank of the Genesee river feeder at Oramel to the Allegany river at Mill Grove pond, and has been in charge of W. H. Withey, as superintendent, during the fiscal year.

The mechanical structures upon the section are as follows: Thirty-four lift and two guard-locks, four aqueducts, fifteen waste-weirs, twenty-three culverts, thirty-two wood road, four iron road, one iron-chord road, fourteen wood farm, one wood towing-path, one wood foot and two wood road and towing-path change bridges, four dams, two bulk-heads and four lock-houses.

A breach occurred, October 20, 1872, in the berme bank of the canal, near Martin's Mills, at Olean, causing a delay to navigation of four days.

Before the opening of navigation last spring, a large number of breaches, in both banks of the canal, both upon the main line and extension, occurred in consequence of floods in adjacent streams. These breaches having occurred in April, it was impossible to get the repairs complete before the 20th of May, hence the opening was somewhat delayed in consequence.

Several other small breaches have occurred during the season of navigation, principally between the 22d of August and September 19, causing delays amounting, in the aggregate, to ten days.

General repairs have been made to all of the locks upon the section which, together with the insertion of some new gates, have cost the sum of.....	\$2,727 38
Lock-tending has cost the sum of.....	4,430 26
The aqueducts at Olean have been thoroughly overhauled and put in good order at a cost of.....	427 83
The several waste-weirs on the section have been thoroughly repaired at an expense of.....	452 45
Some needed repairs have been made to culverts at a cost of.....	190 79



Five wood road and three wood farm bridges and one wood towing-path bridge have been erected, costing the sum of.....	\$2,874 60
Most of the other bridges upon the section have been repaired by inserting new needle beams and floor timbers and replanking at a cost of.....	1,153 57
Repairs of state scows have cost.....	120 11
There has been expended in raising and repairing towing-path and berme banks, the sum of.....	1,358 04
For cleaning out bottom of canal during spring repairs, the sum of.....	848 41
For repairing the river dam at Mill Grove by driving piles and putting in new apron, torn out by ice and flood-wood, together with repairs to the Oswayo creek and Rockville reservoir outlet dams, the sum of,	1,886 52
For repairs of breaches heretofore mentioned, the sum of.....	5,196 44
For breaking ice and assisting boats in consequence of same, the sum of.....	176 27
For watching canal, regulating water and for general foreman labor on whole section.....	1,049 98
For new wheelbarrows and tools, and for repairs of old, the sum of.....	190 79
For repairs of lock-house, and for other miscellaneous matters, the sum of.....	1,636 18

*Summary of Expenditures.*

Expended by superintendent for new work or structures.....	\$2,874 60
Expended by superintendent for ordinary repairs.....	21,845 02
Superintendent's salary.....	1,500 00
Clerk hire.....	900 00
	<u>\$27,119 62</u>

TABLE NO. 1.

WORKS COMPLETED DURING FISCAL YEAR, ENDING SEPTEMBER 30, 1873.

The following works, authorized by the legislature and canal board, have been completed during the fiscal year ending September 30, 1873, and the final accounts rendered for same :

## ERIE CANAL.

CHARACTER OF WORK.	PAID BY DRAFT.		Total.
	Amount paid during fiscal year.	Amount previously paid.	
<i>Extraordinary repairs.</i>			
Removing deposit from Black Rock harbor .....	\$13,584 00	\$26,401 00	\$39,985 00
Doubling-lock, Berlin Lock.....	15,671 89	17,950 00	33,621 89
" lower lock at Lockville....	5,439 68	28,035 00	33,474 68
" middle " " " .....	8,783 62	32,504 00	41,287 62
" upper " " " .....	5,830 10	30,515 00	36,345 10
Reducing bottom of Erie canal on Sects. 277, 278, 282, 283, 285 and 286....	4,195 50	1,581 00	5,776 50
Iron bridge, Smith street, Rochester..	561 20	2,040 00	2,601 20
" on Construction 'Sec. 275	881 16	4,284 00	5,165 16
Iron T. P. bridge over G. V. canal at junction with Erie canal.....	461 48	1,530 00	1,991 48
Vertical walls at Bushnell's basin and Cartersville.....	1,142 70	1,972 00	3,114 70
Raising and improving Sulphur Spring guard-lock .....	5,131 31	2,210 00	7,341 31
Rubble-wall in cement across the old canal at east end of new aqueduct over Genesee river, Rochester.....	341 85	459 00	800 85
Inserting wrought-iron beams and repairing following bridges in Buffalo: Commercial, Lloyd, Amherst and Canal streets.....	10,785 98	2,125 00	12,910 98
Rebuilding Hamilton street T. P. change bridge of iron (W. B. Cooper's) Buffalo.....	2,497 96	1,700 00	4,197 96
Docking and clearing out state ditch, Tonawanda .....	2,328 41	.....	2,328 41
Constructing waste weir on Lock Berlin level, new location.....	3,025 28	.....	3,025 28
Setting back berme abutment and constructing an iron bridge in place of wooden one, at Lockville.....	4,998 73	.....	4,998 73
Iron pipe culvert, 3 mile level, Brighton	7,019 78	.....	7,019 78
Vertical wall along premises of H. A. Robertson, Middleport.....	1,733 22	.....	1,733 22

TABLE NO. 1 — (Continued).

CHARACTER OF WORK.	PAID BY DRAFT.		Total.
	Amount paid during fiscal year.	Amount previously paid.	
<i>Extraordinary repairs.</i>			
Vertical wall in front of premises of Underhill, Braman & Co., Brockport,	\$1,813 67	.....	\$1,813 67
Vertical wall along premises of A. Mesler, Gasport .....	911 53	.....	911 53
Vertical wall front of stone yard of Squire & Phillips, Hulberton.....	1,437 21	.....	1,437 21
Vertical wall opposite quarry of E. Sullivan, Albion.....	936 58	.....	936 58
Dredging Erie basin, city of Buffalo...	7,374 62	.....	7,374 62
Inserting iron needle-beams in Washington and Ford streets, Rochester..	2,715 15	.....	2,715 15
Iron bridge, etc., on Nelson st., Rochester.....	6,713 59	.....	6,713 59
Swartz lift bridge, through T. P. lower, Black Rock.....	1,721 09	.....	1,721 09
Wrought-iron bridge over Ohio street, at crossing of Ohio street, Buffalo...	7,379 79	.....	7,379 79
Iron protection railing on berme side canal South Saint Paul street, Rochester.....	871 36	.....	871 26
<i>Canceled.</i>			
Deepening Erie canal from 1st lock to Lyell street, Rochester.....	5,652 44	\$45,315 00	50,967 44
Protecting canal against encroachments of Lake Erie (relet).....	1,635 25	.....	1,635 25
Deepening and improving canal from slip No. 3 to Black Rock harbor (relet).....	9,970 28	.....	9,970 28
Total.....	\$143,546 41	\$198,621 00	\$342,167 41
<b>GENESEE VALLEY CANAL.</b>			
Iron bridge at Hinsdale.....	\$512 62	\$1,734 00	\$2,246 62
Cast-iron pipe culvert under G. V. C., at Cuylerville, and clearing out state ditch.....	2,363 04	.....	2,363 04
Total.....	\$2,875 66	\$1,734 00	\$4,609 66

TABLE No. 2.

WORKS IN PROGRESS AT THE CLOSE OF FISCAL YEAR, ENDING  
SEPTEMBER 30, 1873.

The following named works, authorized by the legislature and the canal board, were under contract and in progress at the close of the fiscal year, ending September 30, 1873:

CHARACTER OF WORK.	PAID BY DRAFTS.		Total.
	Amount paid during fiscal year.	Amount previously paid.	
ERIE CANAL.			
<i>Extraordinary repairs.</i>			
Removing bench walls and constructing slope wall and pavement between Lyons and Lockville.....	\$4,284 00	\$37,774 00	\$42,058 00
Doubling Clyde lock.....	4,539 00	12,580 00	17,119 00
“ Lyons “ .....	2,186 00	5,889 00	8,075 00
“ Poor-house lock.....	6,800 00	23,375 00	30,175 00
“ lower Macedon lock.....	10,591 00	8,364 00	18,955 00
“ Pittsford “ .....	15,300 00	13,005 00	28,305 00
“ Miller's “ .....	11,390 00	10,880 00	22,270 00
“ lock No. 3, east of Rochester	17,001 00	8,295 00	25,296 00
“ “ 2, “ “ .....	3,095 00	8,295 00	11,390 00
“ “ 1, “ “ .....	25,483 00	17,119 00	42,602 00
Protecting canal against encroachment, Lake Erie.....	.....	.....	.....
Renewing material from prism E. C., sections 207, 208, 209 and 212.....	.....	391 00	391 00
Iron bridge on town line between Gates and Greece.....	.....	3,825 00	3,825 00
Vertical wall at Fairport.....	.....	884 00	884 00
Cribs and vert. walls, in place of pile docking, between state ditch and military road, Tonawanda.....	40,460 00	.....	40,460 00
Deepening and improving canal from slip No. 3, in the city of Buffalo, to head of Black Rock harbor and for deepening and widening canal, thro' said harbor, and constructing a division bank therein and other work connected therewith, so as to make the canal separate and independent of said harbor.....	32,300 00	.....	32,300 00
Improving channel discharge from Rochester weigh-lock.....	680 00	.....	680 00
Vertical walls on both sides of canal at Lockville.....	10,268 00	.....	10,268 00

TABLE No. 2—(Continued).

CHARACTER OF WORK.	PAID BY DRAFTS.		Total.
	Amount paid during fiscal year.	Amount previously paid.	
Iron road bridge, etc., over Tonawanda creek, at Bush's place and Martinsville.....	\$10,863 00	.....	\$10,863 00
Additional roadway track to change bridge at Tonawanda (road leading to Grand Island ferry).....	.....	.....	.....
Removing remains of state dam on Scajauada creek and bars adjacent, Repairing and reconstructing docking on Clark and Skinner canal, Buffalo, Dredging Black Rock harbor.....	1,921 00	.....	1,921 00
"    Ohio basin, including Ohio canal, from Elk street to Ohio basin, and Ohio slip, from Ohio basin to Buffalo harbor.....	.....	.....	.....
Dredging Erie basin, city of Buffalo..	.....	.....	.....
Total.....	\$197,161 00	\$150,676 00	\$347,837 00

GENESEE VALLEY CANAL.			
Deepening summit level, from lock 97 to entrance of feeder from Oil Creek reservoir.....	.....	\$969 00	\$969 00
Stone abutment and docking at east end of Genesee River dam, Mount Morris.....	\$5,916 00	4,675 00	10,591 00
Total .....	\$5,916 00	\$5,644 00	\$11,560 00

*STATEMENT showing the expenditures upon this division for and during the fiscal year, ending September 30, 1873.*

ORDINARY REPAIRS.

NAME OF WORK OR EXPENDITURE MADE.	PAYMENTS.		Total.
	Amount paid during fiscal year.	Amount previously paid.	
<i>General management.</i>			
Commissioner's salary and travel....	\$2,700 00	.....	\$2,700 00
Clerk hire, office rent and contingent expenses of canal commissioner's office at Rochester.....	2,006 08	.....	2,006 08
Total.....	\$4,706 08	.....	\$4,706 08

ERIE CANAL.

Repair section No. 10.....	\$30,150 03	.....	.....
Repair section No. 10, superintendent's salary.....	1,500 00	.....	\$31,650 03
Repair section No. 11.....	50,236 98	.....	.....
Repair section No. 11, superintendent's salary.....	1,500 00	.....	51,736 98
Repair section No. 12.....	29,618 13	.....	.....
Repair section No. 12, superintendent's salary.....	1,500 00	.....	31,118 13
Repair section No. 13.....	30,374 60	.....	.....
Repair section No. 13, superintendent's salary.....	1,500 00	.....	31,874 60
Repair section No. 14.....	60,167 56	.....	.....
Repair section No. 14, superintendent's salary.....	1,500 00	.....	61,667 56
Services as division agent, including travel.....	925 00	.....	925 00
Services as agent on canals and assistant clerk to board of canal commissioners.....	1,518 75	.....	1,518 75
Special services on western division, as directed by the auditor.....	200 00	.....	200 00
Engineering and examining claims for the board of canal appraisers..	100 00	.....	100 00
Engineering, inspecting and incidental expenses.....	678 50	.....	678 50
Total.....	\$211,569 55	.....	\$211,569 55

## STATEMENT — (Continued).

NAME OF WORK OR EXPENDITURE MADE.	PAYMENTS.		Total.
	Amount paid during fiscal year.	Amount previously paid.	
GENESEE VALLEY CANAL.			
Repair section No. 1.....	\$39,009 00	.....	.....
Repair section No. 1, superintendent's salary.....	1,500 00	.....	\$40,509 00
Repair section No. 2.....	40,258 91	.....	.....
Repair section No. 2, superintendent's salary.....	1,500 00	.....	41,758 91
Repair section No. 3.....	25,619 62	.....	.....
Repair section No. 3, superintendent's salary.....	1,500 00	.....	27,119 62
Travel and witness fees in the claim of Geo. M. Cuyler before canal ap- praisers at Albany.....	87 62	.....	87 62
Engineering, inspecting and incidental expenses.....	335 00	.....	335 00
Total .....	\$109,810 15	.....	\$109,810 15

**ERIE CANAL.***Extraordinary repairs.*

On construction contracts, as per table No. 1.....	\$143,546 41	\$198,621 00	\$342,167 41
On construction contracts, as per table No. 2.....	197,161 00	150,676 00	347,837 00
Land damages .....	725 00	.....	725 00
Printing and publishing notices of let- ting .....	1,289 83	.....	1,289 83
Supervising and inserting tumble-gates in doubling locks (see resolution of canal board March 6, 1873).....	1,302 00	.....	1,302 00
Engineering, inspecting and incidental expenses .....	16,332 00	.....	16,332 00
Total .....	\$360,356 24	\$349,297 00	\$709,653 24

**GENESEE VALLEY CANAL.**

On construction contracts, as per table No. 1.....	\$2,875 66	\$1,734 00	\$4,609 66
On construction contracts, as per table No. 2.....	5,916 00	5,644 00	11,560 00
Engineering, inspecting and incidental expenses .....	623 50	.....	623 50
Total .....	\$9,415 16	\$7,378 00	\$16,793 18

*STATEMENT—(Continued).*

NAME OF WORK OR EXPENDITURE MADE.	PAYMENTS.		Total.
	Amount paid during fiscal year.	Amount previously paid.	
ENLARGEMENT OF ERIE CANAL.			
Drafts and certificates for awards made by canal board and canal appraisers,	\$2,942 59	.....	\$2,942 59
Counsel fees before canal appraisers..	2,050 55	.....	2,050 55
Total .....	\$4,993 14	.....	\$4,993 14
CONSTRUCTION OF GENESEE VALLEY CANAL.			
Drafts and certificates for awards made by canal board and canal appraisers,	\$9,718 04	.....	\$9,718 04
Survey of Allegany river and adjoining land above Millgrove dam, act chapter 694, Laws of 1871.....	2,081 15	.....	2,081 15
Total .....	\$11,799 19	.....	\$11,799 19
Summary.			
General management .....	\$4,706 08	.....	\$4,706 08
Ordinary repairs, Erie canal .....	211,569 55	.....	211,569 55
Extraordinary repairs, Erie canal....	360,356 24	\$349,297 00	709,653 24
Enlargement, Erie canal .....	4,993 14	.....	4,993 14
Ordinary repairs, Genesee Valley canal,	109,810 15	.....	109,810 15
Extraordinary repairs, Genesee Valley canal .....	9,415 16	7,378 00	16,793 16
Construction, Genesee Valley canal..	11,799 19	.....	11,799 19
Total .....	\$712,649 51	\$356,675 00	\$1,069,324 51



TABLE NO. 3.

Table showing the amount of work done, for which finals were rendered during the following years, including engineering and miscellaneous expenditures connected therewith:

## EXTRAORDINARY REPAIRS—ERIE CANAL.

1868.

Character of work.	Amount.
Wrought-iron swing bridge, including piers and landings for crossing Black Rock harbor on Ferry street, Buffalo .....	\$12,551 52
Iron plate chord bridge at Fairport .....	1,499 87
Widening entrance to Wilkinson slip, Buffalo, rebuilding abutment and constructing draw-bridge .....	1,499 99
Dredging channel below ship-lock at Black Rock....	998 74
Abutments and approaches for change bridge on construction section 367.....	2,399 18
Tow-path draw-bridge over Ellicott creek, Tonawanda,	1,667 04
Cast-iron draining pipe at Clyde.....	2,899 49
Cast-iron draining pipe one mile west of Clyde lock..	2,697 94
Composite culvert on construction section 261 .....	1,999 96
Partial reconstruction of culvert on construction section 314.....	2,799 57
Vertical wall on Fairport (berme side).....	4,833 77
Vertical wall at Pittsford (berme side).....	3,016 22
Iron feed-pipe through towing-path, between two bridges, Pittsford.....	149 40
Covered drain at Lockport.....	9,491 20
Excavating Erie basin, Buffalo.....	7,996 56
	<hr/>
	<u>\$56,500 45</u>

1869.

Sidewalks on Chicago street bridge, over Main and Hamburg street canal, Buffalo.....	\$6,550 60
Pile jetty-pier at Black Rock harbor.....	6,999 93
Abutments and approach to change bridge section 367,	1,799 46

Character of work.	Amount.
Vertical wall at Port Gibson .....	\$1,840 58
Iron bridge near Medina aqueduct .....	3,899 44
Vertical wall at Middleport .....	4,999 99
Vertical wall at Medina .....	3,000 00
Rebuilding tow-path on construction section 368 .....	30,007 54
Repairing tow-path on construction section 368 .....	24,999 65
Swing bridge, Exchange street, Rochester .....	8,964 50
Protecting docking, etc., of Ohio basin, Buffalo .....	4,635 68
	<u>\$97,697 37</u>

## 1870.

Raising tow-path wall and bank on section 368 .....	\$7,900 14
Inserting wrought-iron rolled needle-beams in Wash- ington street bridge, over Main and Hamburg street canal, Buffalo .....	1,999 53
Timber road bridge over spillway, Tonawanda .....	457 84
Improving Main and Hamburg street canal, Buffalo ..	11,591 45
Completing Clark and Skinner canal at Buffalo .....	19,877 11
Vertical wall near Albion, opposite quarry of Whit- more, Carson & Co .....	3,300 00
Extending pier at head of combined locks, Lockport ..	1,337 54
Timber road bridge over channel, Cartersville waste- weir .....	1,095 29
Restoring damages occasioned to repair section 14, between Erie street, Buffalo, and section 366, caused by gales, etc., in 1869 .....	40,000 00
Dredging Ohio basin, Buffalo .....	18,205 00
Abutments for bridge to connect Ferry and Smith streets, Brockport .....	2,505 46
Iron bridge at Brockport .....	7,355 68
Removing old warehouse foundation, Black Rock harbor .....	2,887 50
Iron bridge at Pittsford .....	2,997 18
Taking out old wood beams and inserting new iron needle-beams on bridges at Brockport and Roch- ester .....	1,882 22
Iron bridge on Market street, Palmyra .....	5,131 54
Sluice culvert from state ditch to canal, town of Pen- dleton .....	3,284 61
Stop-dam at junction of Genesee river feeder and Erie canal, Rochester .....	1,865 85

Character of work.	Amount.
Removing easterly bridge at Palmyra, and constructing an iron road bridge.....	\$9,775 99
Iron bridge in place of wood on Hitchins' road, Lockport .....	2,406 43
Dock along the Howard Agricultural Works, Main and Hamburg street canal, Buffalo.....	3,295 24
Removing about 800 feet of division bank, south end of Black Rock harbor .....	9,465 18
Extending abutments and constructing tow-path bridge, Macedon. ....	2,524 82
Iron bridge (Britton's patent), Elk street, Buffalo....	2,418 13
	<hr/>
	\$163,559 73
	<hr/>

## 1871.

Sidewalks on Fulton street bridge, Buffalo .....	\$499 74
Steam canal dredge, including boats, tools, etc.....	19,474 36
Docking along channel to Niagara river, below shiplock, Black Rock.....	589 95
Raising and recoping Black Rock pier, between Grand Trunk railroad crossing and commencement of south pier.....	9,480 34
Removing abutments and superstructure of old bridge, and constructing a new iron bridge, etc., and the walls connected therewith, over the slip leading from Erie canal to river lock at Tonawanda .....	5,658 98
Sluice culvert from state ditch to canal (Hodginsville),	1,915 87
Extending Black Rock pier and removing old pier ...	9,305 65
Waste-weir on three-mile level, Brighton.....	1,776 80
Vertical wall on both sides of canal at and near Shelby basin.....	2,773 25
Dredging Ohio basin, Buffalo, award by canal commissioners, act chap. 585, laws of 1871 .....	13,984 04
Improving channel way and discharge culvert of Thomas creek... ..	3,057 02
Ditch to drain lands of Thomas McGuire, Murray, Orleans county.....	1,329 52
Tile drain through Benjamin F. Sherman's land, Clyde	400 00
Swing bridge at Albion .....	15,071 26
Improving and widening canal, and constructing vertical wall between Erie and Commercial streets, Buffalo,	28,896 35

Character of work.	Amount.
Vertical wall at Otter creek, near Eagle harbor .....	\$2,112 83
Vertical wall at Reynale's basin .....	1,056 00
Improving and protecting discharge from Newark waste-weir .....	2,999 30
Additional sluice from state ditch on south-east side to Erie canal, Lockport .....	3,208 12
Iron bridge at McCarthy's, near Holley .....	2,216 36
Iron bridge at Mabie's, near Gasport .....	2,629 66
Iron bridge at Orangeport .....	3,071 66
Vertical wall between 3d and 4th locks east of Roch- ester .....	1,419 89
Improving and completing Main and Hamburg street canal, Buffalo .....	13,841 50
Dredging channel around north end of Erie basin breakwater .....	16,933 17
Dredging channel around north end of Erie basin breakwater, award by canal commissioners, act chap. 585, laws of 1871 .....	15,676 10
Stop-gate between deep hollow culvert and wide water, west of Rochester .....	9,732 91
Taking out old wood beams and inserting new iron rolled needle-beams on bridges in Clyde, Lyons and Newark .....	4,603 42
Inserting iron needle-beams in bridges at Comstock and Adams streets, Lockport; Millard, Hindsburgh and Shelby streets, Medina .....	6,492 42
Inserting iron needle-beams in bridges at Ferry, Gen- esee, Prime, Perry and Michigan streets, Buffalo...	9,515 40
Inserting iron needle-beams in bridges at Port Gibson and Palmyra .....	2,068 55
Vertical wall at Pendleton .....	3,326 25
Iron bridge over Ohio basin slip, Fulton street, Buffalo	5,847 98
Iron bridge on Georgia street, Buffalo .....	11,987 67
	<hr/>
	\$232,952 32

## 1872.

Dredging Erie basin, Buffalo.....	\$2,320 00
Vertical wall opposite quarry of Thomas Hodge, Albion .....	1,500 00
Repairing north bank of canal along Tonawanda creek, and protection of highway, town of Pendleton .....	1,534 47

Character of work.	Amount.
Changing tow-path along high clay bluff, west of Rochester.....	\$3,051 00
Cement-pipe sewer to connect with state ditch culvert under Erie canal at Tonawanda.....	2,594 86
Iron bridge near Leach's mills at Lyons.....	2,435 55
Wrought-iron swing bridge over Child's slip, Rochester	5,884 48
Stop gate between Spencerport and Adams' basin....	8,283 40
Iron bridge on Transit street, Lockport.....	4,915 62
Waste-weir through north wall of canal aqueduct over Genesee river, Rochester.....	2,554 12
Deepening and improving narrow canal, Black Rock harbor .....	44,985 73
Doubling guard-lock, Black Rock.....	45,762 62
Retaining wall in Ohio basin, Buffalo....	1,974 43
Inserting wrought-iron needle-beams in bridges; one at Eagle harbor and one at Young's, near Lockport,	1,744 71
Guard-piers and raising, protecting and securing swing bridge at Ferry street, Black Rock harbor.....	4,880 95
Stop-gate at Holley.....	2,998 07
Crib work and vertical walls on guard-lock section, Black Rock.....	25,738 23
Vertical wall, bridge across state ditch and improving grade of main road approach at Macedon.....	3,609 75
Extending, raising and strengthening the division banks between the canal and mill race, at lower Black Rock.....	4,995 42
	<u>\$171,763 41</u>

## 1873.

Rubble wall east end of Rochester aqueduct.....	\$800 85
Bridge over Mill street, Black Rock (award to J. B. Griffin).....	1,922 00
Vertical wall opposite stone-yard of Squire & Phillips, Hulburton, Orleans county.....	1,437 21
Tile drain at Lyons, Wayne county.....	175 00
Inserting iron needle-beams in Washington and Ford streets, Rochester.....	2,715 15
Swartz's lift bridge over Pratt's slip through tow-path, lower Black Rock.....	1,721 09

Character of work.	Amount.
Inserting wrought-iron needle-beams and repairing Commercial, Lloyd, Amherst and Canal street bridges, Buffalo .....	\$12,910 98 .
Vertical wall opposite Sullivan's quarry, Albion.....	936 58
Iron pipe culvert on three-mile level, Brighton.....	7,019 78
Setting back berme abutment and building iron bridge at Lockville.....	4,998 73
Vertical wall front of Underhill, Braman & Co., Brockport .....	1,813 67
Raising and improving Sulphur Spring guard-lock....	7,341 31
Iron swing bridge over slip connecting Ohio basin with Buffalo harbor at Ohio street, Buffalo.....	7,379 79
Removing deposit from Black Rock harbor.....	39,622 40
Waste-weir on Lock Berlin level (new location) .....	3,025 28
Rebuilding Hamilton street bridge of iron, Buffalo...	4,197 96
Vertical wall along premises of H. A. Robertson, Middleport.....	1,733 22
Receiver at White's creek, Wayneport.....	3,034 13
Iron bridge, etc., on Nelson street, Rochester.....	6,713 59
Vertical walls at Bushnell's basin and Cartersville....	3,114 70
Iron bridge at Smith street, Rochester.....	2,601 20
Iron tow-path bridge at junction Erie and Genesee Valley canal, Rochester.....	1,991 48
Vertical wall on berme bank along premises of A. Mesler, Gasport .....	911 53
Doubling lower lock at Lockville.....	33,495 31
“ middle “ “ “ .....	41,308 83
“ upper “ “ “ .....	36,366 90
“ Pittsford lock.....	34,289 23
“ Lock Berlin lock .....	33,643 69
“ Lock No. 1, east of Rochester.....	49,721 98
Patent fee for Heath's tumble gates in Lock Berlin, Poor-house, lower, middle and upper locks at Lockville, also Pittsford and Lock No. 1, east of Rochester.....	798 00
Tumble gates and platform in the Old Poor-house and lower Macedon locks.....	4,499 99
Iron bridge on section 275, town of Ogden.....	5,165 16
Dredging Erie basin, Buffalo.....	7,374 62
Docking and cleaning out state ditch immediately north of Tonawanda creek, village of Tonawanda.....	2,328 41

Character of work.	Amount.
Protecting canal against encroachments of Lake Erie, between head of Black Rock harbor and Erie basin breakwater (canceled).....	\$1,635 25
Deepening canal from 1st lock east of Rochester, west to Lyell street (canceled).....	51,354 28
Reducing bottom of canal in sections 277, 278, 282, 283, 285 and 286.....	5,776 56
Deepening and improving canal from slip No. 3, to about 1,200 feet below Ferry street, Buffalo (canceled)	9,970 28
Deepening and improving canal from slip No. 3, to about 1,200 feet below Ferry street, Buffalo, and expended by canal commissioner (canceled).....	79,507 38
Iron protection railing on South Saint Paul street, Rochester .....	871 36
Doubling Poor-house lock .....	35,995 49
Iron road bridge over Tonawanda creek, near Bush's place and Martinsville.....	14,323 24
	<u>\$566,543 59</u>

## GENESEE VALLEY CANAL.

1868.

Iron bridge over State street, Nunda, and Main street, Mount Morris.....	\$6,100 00
Approaches to Tremont street bridge, Rochester.....	1,308 00
	<u>\$7,408 00</u>

1869.

Re-opening and enlarging ditches and creek channels near Beard's creek aqueduct, on both sides canal...	\$4,998 81
Vertical wall at Rochester.....	1,200 00
Removing obstructions and deepening channel on repair section No. 2, at different points.....	4,199 80
Rebuilding seven spans of Ischua Feeder aqueduct...	21,006 95
Deepening, widening and improving Genesee Valley canal, contract canceled.....	12,442 03
Deepening, widening and improving Genesee Valley canal, award by canal board, September 8, 1869, act chapter 914, laws of 1869.....	22,808 20
	<u>\$66,655 79</u>

1870.

Character of work.	Amount.
Iron bridge at Blood's farm. ....	\$1,531 33
Dam at Smith's mill, near Hinsdale.....	6,290 22
Ischua reservoir.....	22,704 85
Improving Ischua feeder.....	4,049 79
Overflow spillway below Nunda.....	5,166 57
Protecting tow-path bank near lock 71, on account of break of Genesee river through feeder at Oramel...	7,998 95
New channel from Genesee river to the bulk-head of Murray's mill canal at Mount Morris.....	1,193 86
Iron bridge with stone abutments at Mount Morris...	6,028 34
Iron bridge over Griffin's creek feeder, Main street, Cuba.....	5,621 54
Deepening the culvert under canal near lock 2.....	1,999 88
Improving and securing the outlet to Rockville reser- voir.....	1,962 89
Iron road and change bridge at Olean.....	2,292 10
	<hr/>
	\$66,840 32

1871.

Iron bridge at Atchinson street, Rochester .....	\$1,821 87
Iron bridge at Adams street, Rochester .....	1,806 36
Rebuilding guard bank at Hume.....	2,340 56
Completing the widening and improving canal from guard-lock to the junction with the Erie canal, Roch- ester.....	87,370 50
Raising Oil creek reservoir.....	131,904 49
Slide on repair section No. 2, Portage.....	79,325 35
Slide on repair section No 2, Portage, award by canal commissioner, act chapter 891, laws of 1871.....	14,502 85
	<hr/>
	\$319,071 98

1872.

Cleaning out channel of Beard's creek, etc.....	\$6,498 61
Iron bridge at Cumminsville.....	1,439 97
Raising dam embankment, Oil creek reservoir, and facing same with loose stone.....	1,294 49
Bridge at West Sparta.....	600 00



Character of work.	Amount.
Iron bridge at Fillmore.....	\$1,567 53
Protecting canal against encroachments of Genesee river, about three-fourths of a mile south of Portageville .....	1,062 00
Iron bridge at Canawaugus .....	1,983 10
	<hr/>
	\$14,445 70
	<hr/>

## 1873.

Cast-iron pipe culvert at Cuylerville, Livingston county,	\$2,364 04
Iron bridge, Clinton street, Hinsdale.....	2,246 62
Abutments and docking at east end of dam across Genesee river at Mount Morris.....	12,886 05
Wooden bridge at Woodville, Livingston county.....	800 00
	<hr/>
	\$19,295 71
	<hr/>

TABLE NO. 4.

Works now unfinished and under contract, and amounts paid on same to January 1, 1874:

## ERIE CANAL.

*Extraordinary repairs.*

Character of work.	Amount.
Removing bench-walls and constructing slope-wall and pavement between Lyons and Lockville.....	\$42,058 00
Doubling Clyde lock.....	18,666 00
“ Lyons lock.....	9,792 00
“ lower Macedon lock.....	24,225 00
“ Miller's lock.....	25,160 00
“ lock No. 3, east of Rochester.....	27,540 00
“ lock No. 2, east of Rochester .....	19,040 00
Protecting canal against encroachments of Lake Erie..	7,021 00
Removing material from prism Erie canal, sections 207, 208, 209 and 212.....	391 00
Vertical wall at Fairport.....	1,020 00
Cribs and vertical walls, in place of pile docking between state ditch and Military road, Tonawanda..	42,806 00

Character of work.	Amount.
Deepening and improving canal from slip No. 3, in the city of Buffalo, to head of Black Rock harbor, and for deepening and widening canal through said harbor and constructing a division bank therein, and other work connected therewith, so as to make the canal separate and independent of said harbor.....	\$62,220 00
Improving channel discharge from Rochester weighlock.....	680 00
Vertical walls on both sides of canal at Lockville.....	10,268 00
Additional roadway track to change bridge at Tonawanda (road leading to Grand Island ferry).....	374 00
Removing remains of state dam on Scajaquada creek, and bars adjacent.....	.
Repairing and constructing docking on Clark and Skinner canal, Buffalo.....	
Dredging Black Rock harbor.....	1,921 00
Dredging Ohio basin, including Ohio canal, from Elk street to Ohio basin, and Ohio slip from Ohio basin to Buffalo harbor.....	510 00
Dredging Erie basin, city of Buffalo.....	646 00
Cleaning out, improving and deepening the canal, an average of 6 inches below established grade, between Thomas creek culvert and Macedon locks.....	
Vertical wall, village of Gasport (70 feet).....	
“ “ B. S. Pittsford (100 feet).....	
“ “ one mile east of Albion (200 feet).....	
“ “ three miles east of Albion (150 feet)...	
“ “ village of Spencerport (275 feet).....	289 00
“ “ Adams basin (100 feet).....	102 00
“ “ Port Gibson (125 feet).....	
“ “ Fairport, near Winnie bridge (100 feet),	
“ “ Macedon (100 feet).....	
Removal, replacement and repair of the bridge on Ohio street, over Clark and Skinner canal.....	
Constructing three wood bridges over state ditch, Tonawanda. ....	
Protection wall and repairing approaches to bridge near lot 97 of Niagara river reservation .....	
Iron bridge on town line between Gates and Greece..	5,253 00
Total .....	<u><u>\$289,323 00</u></u>

## GENESEE VALLEY CANAL.

Character of work.	Amount.
Deepening summit level from lock 97 to entrance of feeder from Oil creek reservoir.....	\$969 00

*Summary.*

Erie canal completed .....	\$1,289,016 87
“ “ uncompleted .....	289,323 00
Genesee Valley canal completed .....	493,717 50
“ “ “ uncompleted .....	969 00
Total.....	<u>\$2,073,025 37</u>

## ERIE CANAL.

*Extraordinary repairs.*

At the date of my last annual report, the work for protecting the canal against the encroachments of Lake Erie, between Erie basin breakwater and Black Rock pier, was under contract to the extent of \$75,000, to Charles P. Skinner. He had, however, done but a small amount of work under said contract. The engineers were desirous the plan of the work should be changed, and in the act of last winter appropriating \$25,000 more for said work, the canal board were authorized to cancel said contract and relet the work on such plan as should be approved by the state engineer and surveyor. On application of the contractor the canal board canceled said contract, adopted the plan of the state engineer and surveyor, and authorized the work let on said plan, and to the extent of existing appropriations therefor, to wit, about \$98,000. The work to this extent was advertised and let to Clark & Bennett, and has since been prosecuted in a satisfactory manner, and will probably be completed, so far as the same can be under the present appropriation therefor, during next season, as it can only be done to advantage in calm weather, in the summer and fall months of the year.

The engineers are of the opinion, however, that such protection should be extended over the whole distance (about 5,000 feet) between said breakwater and pier, not only for the purpose of protecting the canal, but to furnish additional facilities for the transshipment of property from lake to canal craft, and *vice versa*, and they

deem it a question of time only when it will become absolutely necessary; and, with a view to the progressive accomplishment of such object, I would recommend that a further appropriation of \$100,000 be made for that purpose.

Should such appropriation be made, then, when the above contract is completed, an additional stretch of said protection, or break-water, can be contracted for, and, in this manner, the work may be progressed by subsequent appropriations, until the whole shall be finally completed on the plan above indicated.

A rough estimate of the cost of the whole work, between Erie basin break-water and Black Rock pier, including that now under contract, is about \$300,000.

The deepening and improving the canal from slip No. 3 to the head of Black Rock harbor, including widening, deepening and improving the canal through the narrow part of said harbor, and constructing a division bank therein so as to separate the canal from and make it independent of said harbor, were let to E. B. Van Dusen on the 30th day of August, 1872. He commenced the work, constructed a small portion of division bank, and did some excavation before the close of navigation of that year. After the close, he erected pumps, constructed dams and commenced pumping, intending to pump out the water so as to enable the earth and rock excavation in the prism to be removed. His dams were not sufficiently tight and secure to enable him to do so at first, and even up to the latter part of January of this year, 1873, he had not reduced the water low enough to commence work. He also discovered that the sewage of the city of Buffalo did, to a large extent, discharge into his work. He applied to the common council of said city, and subsequently to the canal board, for relief from the sewage and water brought in by same, claiming that it was unknown to him, when he bid for said work, that the sewers of said city discharged into the canal, and that his contract with the state did not require him to take out the deposits occasioned by and water brought in by such sewage. The canal board did not, however, grant any relief, and the soft weather, which soon followed his application to the board, brought in so much water through the sewers, that his pumps could not handle it, and, on the 4th of February last, he became so discouraged that he declined and failed to proceed with the work as directed.

The portion of canal embraced in said contract is on the lake level, and was originally constructed too shallow to allow fully-laden boats to pass through the same during as low stages of water in the

lake as had been experienced during the previous two seasons. It was of the utmost importance to navigation in that vicinity that the work should proceed at once, and the time being too limited to re-advertise and let it again for that purpose, the undersigned took immediate possession of the work, as the contract authorized him to do in such cases, and proceeded with it, by the day, under the general charge of Superintendent Welch and Division Engineer Behn, and, before the opening of navigation last spring, a channel 80 feet in width through the wide canal, and about 60 feet in width through the narrow canal, was made, and of a depth sufficient to meet the low stages of the lake, and fully-laden boats have passed through the same, at all times, during the lowest water of the past season.

The work was done under disadvantages, and would have been expensive at best. Five steam pumps were kept running constantly day and night during the time, and the expense of these, together with the repairs and removal of dams, and removal of large accumulations of snow and ice, to enable the excavation to be done, constituted a large item in the cost of the work.

The whole cost of the work so done by the undersigned in making such channel, through a distance of nearly three miles, was \$79,507.38 from which deduct \$8,500 for pumps, engines, tools, etc., purchased for said work and turned over to the present contractor, and applied in payment for work done by him thereon, leaves the cost of the work so done by the undersigned \$71,007.38.

On the 24th day of June last, the contractor for said work applied to the canal board to cancel his said contract, and, after hearing the argument of his counsel, the board concluded to, and did pass a resolution canceling said contract, as authorized by act chapter 766 laws of 1873. At the same meeting said board passed the following resolution offered by Mr. Taylor :

*Resolved*, That the maps, plans and estimates this day presented by J. Frederick Behn, division engineer, for deepening and improving the canal from slip No. 3, in the city of Buffalo, to the head of Black Rock harbor, and for widening and deepening the canal through said harbor and constructing a division bank therein, so as to separate the canal from and make it independent of said harbor, which, having been approved by the state engineer and surveyor, be and the same are hereby adopted, and the work authorized to be let at not less than ten days' notice, and to the extent covered by the existing appropriations therefor, to wit, \$253,000.

Pursuant to said resolution, the work was advertised and let on the 17th day of July last, to Henry J. Mowry, he being the lowest

bidder therefor. The work has been vigorously prosecuted under the present contract, and if the state shall furnish the requisite means it is anticipated all the rock excavation in the prism will be removed before the opening of navigation next spring, and the whole work, from slip No. 3 to Ferry street, substantially completed by the first of June following, in which case the balance of the work can be finished next summer; otherwise the work will not only be delayed another year, but it will, in all probability, occasion additional cost to the state if it shall be so delayed.

The engineers estimate the cost of completing division bank and work connected therewith in Black Rock harbor, so as to separate the canal from and make it independent of said harbor, at \$170,000.

It is desirable that an appropriation be made for such purpose in order that the work may be fully completed at the earliest day practicable. When said work shall be completed, on the plan now contemplated, the canal proper will have increased width and depth, the lake level virtually extended to the head of the guard lock at Black Rock, and without any flow of water through said channel to supply the mills as now, the current will be so reduced that it can be navigated with as much ease and facility as other parts of the canal, which has not, as yet, been the case since its original construction in 1825. In fact, at times the current is so strong that navigation is not only difficult but even hazardous to boats and their cargoes; of course what has been done has improved it, and what is now being done under existing contract will still further improve it, so far as it goes, but the difficulties to navigation will not be wholly obviated until it is completed as proposed.

The contract for construction of cribs and vertical walls on the inner face of the banks between military road bridge and state ditch culvert, at Tonawanda, is progressing, and it is anticipated the work will be completed before the opening of navigation next spring.

The contract for deepening the Erie canal from Lyell street to the first lock east of the city of Rochester, including cutting down the Genesee river aqueduct, was, upon application of the contractor, canceled by the canal board on the 19th day of March, 1873, for the reasons set forth by the committee to whom the matter was referred, as shown by the following report:

*To the Canal Board:*

Edward W. Williams applies to the canal board to cancel his contract for deepening of the Erie canal from Lyell street to the first lock east of Rochester, etc., dated November 15, 1869.

The board has power to cancel such a contract for good cause shown. Chapter 348, laws of 1849; the provisions of act chapter 495 laws of 1859, seemingly applying only to enlargement and completion mentioned in section 3, article 7 of the constitution (see chapter 169, Laws of 1862). The cause shown here is, that by a resolution of December 6, 1872, the board allowed the water to remain in the canal at this point during the coming winter, thus interfering with the doing of the work, which can only be done when the water is out.

It appears from the statement of the engineer, that of most of the items of the work the contractor has done a larger amount than the quantity sheet exhibited at the letting require. The throwing the work over the winter thus will keep the contractor another year out of the deposit required (\$4,000), and the 15 per cent retained.

I opposed the resolution allowing the water to remain in the canal because (among other reasons) of this interference with contracts, but that resolution having been passed, it seems to me to be equitable, under the circumstances of the case, that the state, having by its own act interfered with the due prosecution of the work, should relieve the contractor from the contract.

(Signed)

FRANCIS C. BARLOW,

*Attorney-General.*

W. B. TAYLOR,

*State Engineer.*

*March 5, 1873.*

The above report having been adopted by the canal board, said contract was accordingly canceled as before stated, and the work has not since been relet; the amount of appropriation remaining unexpended being too small to complete the same. The balance of this work should not only be done, but it should be extended from Lyell street westward to what is called the "wide water," and to accomplish all which, will require an additional appropriation of \$20,000, which I recommend should be made.

Contracts for doubling the remaining single-locks (fourteen in number) on this division, have been in progress for several years past. Eight are completed and the others (six in number) are progressing so favorably that the engineers anticipate they will all be completed next spring; but in case they should not, no trouble to navigation is apprehended from that cause, as the business of the canal on this division has never reached the lockage capacity of

single-locks, and is not likely to for some time to come. Certainty to navigation, however, is secured in degree by double, over single-locks, for in case of accident to one lock navigation may be passed without interruption through the other, while with single-locks alone it must be brought to a stand until the injury is repaired. It is, therefore, desirable that said locks be completed at as early a day as practicable, as I have no doubt they will be under existing contracts therefor.

The Genesee river feeder, which enters the Erie canal at Rochester, is some two and one-fourth miles in length. The high water of the river often overflows the banks of the feeder, and sometimes breaks the same, as was the case last spring. At which times the water runs down the feeder and flows out again near the lower end, running thence over adjoining lands into the river, giving rise to heavy claims for damages, a number of which are now before the canal appraisers for adjudication. The only way to remedy this, is to raise the banks of the feeder above the floods of the river and thus prevent its waters, during freshets, from getting into said feeder.

The estimated cost of said work, including protection to same and the construction of an iron-pipe culvert under said feeder in place of a dilapidated box culvert, is \$30,000.

To uphold the bank and improve the entrance to lock No. 1, east of Rochester, a vertical wall, about 400 feet in length, on the berme side of the Erie canal at the head of said lock, should be constructed.

The estimated cost of same is \$3,500.

For the same reason vertical walls, for about 660 feet in length, should be constructed on both sides of the Erie canal, at the foot of the Poor-house lock. The cost is estimated at \$4,000.

A sharp bend in the towing-path bank below lower Macedon lock throws boats too far over to enable them to enter the lock readily, and thus causes delay, and especially so when meeting other boats on the point, as is often the case. To remedy this the tow-path can be cut off and set back for a distance of six to seven chains in length, running to a point at both ends, and thus materially improve the line and facilitate the approach to and entrance to the lock. The cost of same is estimated at \$2,000.

To pay miscellaneous expenses incident to this division, such as counsel fees, witnesses fees and travel, the employment of agents in examining claims preparatory to hearing of same before canal appraisers, and other expenses connected therewith, etc., I would



recommend that an appropriation of \$5,000 be made for such purpose, there being no fund applicable to the payment of such expenses unless so provided by the legislature.

Heath's plan of tumble gate is used in the new locks now constructing on this division. Also two were put in the old locks last winter, one each in the Poor-house and lower Macedon locks; they work well, and much facilitate locking. I would, therefore, recommend that an appropriation of \$16,000 be made for inserting them in the remaining old locks, as shall be deemed advisable.

Act chapter 766, laws of 1873, appropriates \$10,000 for constructing a bridge over the Erie canal, to connect Averill and Munger streets, in the city of Rochester. The same law requires the commissioner, before proceeding with the work, to obtain from all persons affected by the construction of such bridge and its approaches, good and sufficient releases of all claims for damages, etc., consequent thereto. Some of the parties are unwilling to give releases as required by the law, consequently, the work has not been put under contract.

Act chapter 348, laws of 1871, authorized the construction of a swing bridge, etc., over the Erie canal, at Buffalo street, in the city of Rochester; and act chapter 930, laws of 1871, appropriated \$20,000 to pay therefor, but the bridge, etc., was not constructed as provided for by said laws, for reasons heretofore stated in previous reports; and act chapter 766, laws of 1873, re-appropriated the above-named amount in manner following: "The sum of twenty thousand dollars appropriated by act chapter 930, laws of 1871, for the construction of a swing or draw-bridge over the Erie canal in Buffalo street, in the city of Rochester, is hereby re-appropriated for such purpose, or the state engineer and surveyor may erect a Whipple elevating bridge at said street, in lieu of a draw-bridge, if, in his judgment, said Whipple bridge shall be more economical and practicable than a swing bridge." But the state engineer and surveyor not having acted in the premises, and the canal board not having adopted the plans and estimates as required by law, previous to letting the work, the same has not been put under contract.

#### GENESEE VALLEY CANAL.

All the work of extraordinary repairs heretofore authorized on this canal is completed, except that of \$1,500, appropriated toward the construction of a pipe culvert under said canal in the eighth ward of the city of Rochester, for drainage purposes, which has not

yet been constructed by said city as anticipated, and the turning of the waters of Loon lake into the Dansville branch at Dansville, the latter not having been put under contract, for the reason stated in a previous part of this report.

Black creek, in the town of Chili, passes under the Genesee Valley canal by means of a culvert.. This creek drains the low swamp lands bordering the south side of the canal, in said town. During high floods in the Genesee river the water overflows the banks of the canal across Morgan's flats, and at some other places, doing injury to the banks by breaking the same, as was the case last spring, and flowing thence into the low lands adjoining, and can pass off again only by the culvert through which Black creek runs, thereby causing so much delay in its passage as to seriously incom mode and damage the owners of said low lands. This would not be the case, except from the large acquisition of water thus thrown in by overflowing the banks of the canal in times of freshets, as above stated. This can be remedied by raising the tow-path bank across Morgan's flats and other places, so as to prevent the floods of the river from getting into the canal.

The estimated cost of same is \$2,000.

I therefore recommend that an appropriation be made for that purpose.

#### SUMMARY OF APPROPRIATIONS RECOMMENDED.

For continuing the work of protecting canal against encroachments of Lake Erie, between Ebie Basin breakwater and Black Rock pier, etc.....	\$100,000
For completing division bank and work connected therewith in Black Rock harbor, so as to separate canal from and make it independent of the harbor,	170,000
For cleaning out, improving and deepening the canal an average of six inches below established grade from "wide water," west of tow-path change bridge to the east end of Genesee river aqueduct, in the city of Rochester.....	20,000
For constructing an iron-pipe culvert under Genesee river feeder, and raising banks of said feeder to prevent flood waters of the river from overflowing same, etc.....	30,000
For constructing about four hundred feet in length of vertical wall on berme side of canal at head of lock No. 1, east of Rochester.....	3,500

For cutting off bend in towing-path, including work connected therewith, to improve approach to and entrance to Lower Macedon lock.....	\$2,000
For constructing about six hundred and sixty feet in length of vertical wall on both sides of canal, at foot of poor-house lock.....	4,000
For inserting Heath's plan of tumble gates in old locks on this division, as may be deemed advisable,	16,000
For changing plans of bridges on this division.....	15,000
For paying miscellaneous expenses incident to this division .....	5,000
For raising the towing-path bank on the four and six-mile levels of the Genesee Valley canal, to prevent flood waters of the Genesee river from overflowing same.....	2,000

The appropriations above asked for are such as the undersigned believes will give greater efficiency and permanence to the canals, and increase their usefulness as channels of commerce, and can be provided for only by special acts of the legislature, while the maintenance and ordinary repairs of the canals are paid for out of their revenues, under general acts of the legislature, appropriating so much thereof as may be required for such purpose.

#### GRAIN MOVEMENT UPON THE LAKES AND CANAL.

The following shows the comparative receipts of flour and grain at the ports of Chicago, Milwaukee, Toledo, Detroit, Cleveland and Duluth, from January 1st to November 22d, in the years indicated:

	1873.	1872.	1871.	1870.
Flour, barrels.....	4,332,089	3,283,640	4,575,978	3,992,221
Wheat, bushels.....	54,935,230	31,811,817	38,691,031	41,422,043
Corn, bushels.....	51,119,376	60,302,072	46,068,552	22,761,198
Oats, bushels.....	23,586,178	18,731,233	18,460,061	13,657,711
Barley, bushels.....	5,388,988	5,970,707	3,944,697	4,198,080
Rye, Bushels.....	1,451,505	302,115	2,195,033	1,308,005
Total, bushels.....	136,481,277	117,117,944	109,359,374	83,342,037

The following statement shows the aggregate shipments of flour and grain from the ports of Chicago, Milwaukee, Duluth, Detroit, Toledo and Cleveland by lake and rail for the periods specified :

	From Jan. 1 to Nov. 22, 1873.	From Jan. 1 to Nov. 23, 1872.	From April 1 to Nov. 25, 1871.	From April 1 to Nov. 25, 1870.
Flour, barrels.....	4,546,907	2,912,949	2,624,045	2,321,031
Wheat, bushels.....	52,446,771	26,733,667	31,539,369	34,060,418
Corn, bushels.....	47,318,329	59,923,684	41,352,723	16,534,010
Oats, bushels.....	19,583,888	21,778,572	14,904,227	8,987,297
Barley, bushels.....	3,714,542	5,296,187	2,715,963	1,770,545
Rye, bushels.....	1,104,392	859,505	1,320,458	791,715
Total, bushels.....	124,167,922	114,591,615	91,832,740	62,143,985

The following statement shows the receipts of flour and grain at Buffalo, from January 1st to December 1st, for the years named :

	1873.	1872.	1871.	1870.
Flour, barrels.....	1,134,216	744,150	1,263,577	1,388,239
Wheat, bushels.....	29,858,577	14,124,368	22,485,017	20,269,768
Corn, bushels.....	28,297,328	34,580,587	25,636,196	9,163,291
Oats, bushels.....	5,856,946	6,050,045	8,311,520	6,803,931
Barley, bushels.....	1,048,462	3,003,859	1,825,157	1,764,522
Rye, bushels.....	904,611	301,809	1,086,539	626,154
Peas, bushels.....	56,350	53,464	41,555	61,520
Total, bushels....	66,116,274	58,114,132	59,385,984	38,689,186

The following shows the amount of grain from the elevators of Buffalo by the Erie and Central railroads, from June 1st to December 1st, in 1873 :

Wheat, bushels.....	3,616,714
Corn, bushels.....	3,634,539
Oats, bushels.....	1,296,783
Barley, bushels.....	270,081
Rye, bushels.....	65,459
Total, bushels.....	8,883,576
Same time in 1872.....	6,437,390
Being an increase in 1873 over 1872 of.....	<u>2,445,186</u>

The following shows the amount of flour and grain shipped by canal from Buffalo, in each year during the last four years :

	1873.	1872.	1871.	1870.
Flour, barrels.....	13,570	5,142	45,068	74,384
Wheat, bushels.....	24,773,422	10,871,259	18,916,474	16,316,792
Corn, bushels.....	20,982,809	30,856,690	20,686,195	5,892,954
Oats, bushels.....	3,207,143	4,571,682	6,455,907	5,528,193
Barley, bushels.....	368,062	1,735,684	869,868	844,785
Rye, bushels.....	785,441	211,645	1,025,796	384,056
Total bushels.....	50,130,447	48,246,960	47,954,240	28,966,780

The following table shows the amount of tolls received at Buffalo for the years :

1873 .....	\$1,415,492 27	1868 .....	\$2,037,687 01
1872 .....	1,415,846 57	1867 .....	2,052,335 28
1871 .....	1,389,886 77	1866 .....	2,269,249 02
1870 .....	1,058,625 02	1865 .....	1,932,724 43
1869 .....	1,643,136 48	1864 .....	2,164,763 88

The following statement shows the number of boats cleared at Buffalo, from the opening to the close of navigation for a series of years :

1873.....	9,058	1868.....	7,699
1872.....	8,659	1867.....	7,617
1871.....	8,795	1866.....	8,462
1870.....	6,790	1865.....	6,882
1869.....	6,700	1864.....	7,917

The following table shows the ruling rates of lake freights on corn and wheat from Chicago to Buffalo by sail vessels, on the dates specified in 1873 :

Dates.	Wheat, bushels.	Corn, bushels.	Dates.	Wheat, bushels.	Corn, bushels.
April 3d....	16 cts.	15 cts.	August 4th....	6½ cts.	5½ cts.
April 8th....	17 cts.	16 cts.	August 11th....	5½ cts.	5 cts.
April 15th....	16 cts.	15 cts.	August 18th....	5 cts.	4 cts.
April 22d....	16 cts.	15 cts.	August 25th....	7½ cts.	7 cts.
April 29th....		11 cts.	September 1st....	12 cts.	10 cts.
May 5th....		9½ cts.	September 8th....	14 cts.	13 cts.
May 12th....	7 cts.	6½ cts.	September 15th....	13½ cts.	12½ cts.
May 19th....	6½ cts.	6½ cts.	September 22d....	13 cts.	12 cts.
May 26th....	6 cts.	5 cts.	September 29th....	8 cts.	7 cts.
June 2d....	5½ cts.	5 cts.	October 6th....	9 cts.	8 cts.
June 9th....	7 cts.	6 cts.	October 13th....	8½ cts.	7½ cts.
June 16th....	6½ cts.	5½ cts.	October 20th....	6½ cts.	6 cts.
June 23th....	6 cts.	5 cts.	October 27th....	8 cts.	7 cts.
June 30th....	5½ cts.	5 cts.	November 3d....	8 cts.	7 cts.
July 7th....	6½ cts.	6 cts.	November 10th....	7 cts.	6 cts.
July 14th....	6 cts.	5 cts.	November 17th....	8 cts.	7 cts.
July 21st....	5½ cts.	5½ cts.	November 24th....		
July 28th....	6 cts.	5 cts.	November 28th....		
Average for the season.....				8 1-10 cts.	8 1-20 cts.

The following statement shows the ruling rates of canal freights from Buffalo to New York (tolls included, except for staves), on the dates specified, in 1873 :

1873.	Wheat, bushel.	Corn, bushel.	Oats, bushel.	LUMBER.		STAVES.
				Pine per m. feet.	H. wood per m. feet	Per ton over tolls.
May 15.....	13	11½	.....	\$7 00	\$8 25	\$3 25
May 19.....	12	11	.....	6 75	8 00	3 00
May 26.....	11	10	6½	6 00	7 50	2 87
June 2.....	11	10	6½	5 75	7 50	2 25
June 9.....	10½	9½	6½	5 75	7 50	2 25
June 16.....	10½	9½	6½	6 00	7 75	2 38
June 23.....	10½	9½	6½	6 00	7 75	2 38
June 30.....	10½	9½	6½	5 75	7 75	2 25
July 7.....	10½	9½	6½	5 50	7 50	2 13
July 14.....	10	9	6½	5 75	7 25	2 13
July 21.....	10½	9½	6½	5 75	7 38	2 13
July 28.....	10½	9½	6½	5 75	7 38	2 19
August 4.....	10½	9½	6½	5 75	7 38	2 25
August 11.....	10½	9½	6½	6 00	7 75	2 50
August 18.....	11	10	6½	6 25	7 75	2 50
August 25.....	10½	9½	6½	6 00	7 50	2 50
Sept. 1.....	10½	9½	6½	6 00	7 50	2 38
Sept. 8.....	10½	9½	6½	6 00	7 50	2 38
Sept. 15.....	12	10½	7	5 75	7 00	2 13
Sept. 22.....	14	11½	8½	5 75	7 00	2 25
Sept. 29.....	12	10	7½	6 00	7 25	2 25
October 6.....	12	11	7½	6 00	7 25	2 25
October 13.....	12½	11	7½	6 12	7 50	2 25
October 20.....	13	11	7½	6 12	7 50	2 75
October 27.....	13	11½	7½	6 12	7 50	2 75
Nov. 3.....	12½	11	7½	6 25	7 50	2 50
Nov. 10.....	12	10½	7	6 25	7 50	2 50
Nov. 17.....	13	11½	7	6 25	7 50	2 50
Averages.....	11 3-7	10 1-6	6 4-5	\$6 01	\$7 51	\$2 40

The foregoing tables show that of the aggregate shipments of flour and grain by lake and rail, from the six principal shipping [Assem. Doc. No. 6.] 24

ports on the lakes, from January 1 to December 1, 1873, Buffalo received of flour, 1,134,216 barrels, and of grain, 66,116,274 bushels; that but a fractional part 13,570 barrels of flour and about three-fourths of the grain, to wit, 50,130,447 bushels went forward from Buffalo by canal.

The whole number of boats cleared at Buffalo, during the season of 1873, shows a daily average of nearly fifty, which may be classified, about, as follows :

Grain boats daily.....	30
Lumber boats daily.....	10
Staves, shingle, and hoops.....	5
Miscellaneous cargoes.....	5
	<hr/>
	50
	<hr/>

Fifty boats clearing and fifty arriving, makes 100 in both directions, requiring, of course, 100 lockages per day both ways, or 19,000 lockages in the aggregate, during the past season, which is 11,000 less lockages than can be made by single locks alone.

The Buffalo *Courier* says : " The receipts of wheat in 1873 were more than double those of 1872, while the receipts of corn show a decrease of about 6,000,000 bushels; of barley 2,400,000 bushels, and of oats 200,000. Rye increased 600,000 bushels, and peas 3,000 bushels. The great variation in the two most important cereals was in consequence of the larger yield of the wheat crop in 1872, and the poor quality of the early deliveries of the 1872 corn at western shipping points, causing considerable quantities to be shipped, while the Canadian and western crop of barley of 1873 is well known to be below an average.

" The exports of grain alone by canal, during the season of navigation, were 50,130,447 bushels against 48,246,960 in 1872, showing an increase of 1,883,487 bushels (malt and peas not included).

" The receipts of canal tolls at this place for the season of navigation of 1873, were \$1,415,492.27, being \$354.30 less than in 1872, when the aggregate was \$1,415,846.67. The boats cleared during 1873 numbered 9,058; in 1872, 8,659; being an increase of 399. This exhibit shows very favorably for our canal commerce, especially when the late opening and early closing are taken into consideration. It is noteworthy, also, that the hindrance to navigation by breaks, low water, etc., were of a trifling character, and at no time during the season has the *capacity of the canal been taxed to near its utmost limit.*

"Canal freights have ruled low all the year, the highest rates were 13½ to 14c. on wheat, and 12c. on corn; and the lowest 10c. on wheat and 9c. on corn, to New York.

"Lake freights from Chicago to Buffalo by sail, varied considerably during the year; the highest figures on wheat and corn were 17c. and 16c. respectively; the lowest, 5c. and 4c."

The above shows that whatever excess of freight charges has existed at any time during the past season is chargeable to the lake and not to the canal rates.

The further fact is also established, that the canal lacks neither capacity nor cheapness, but is capable of doing double the business without exceeding its limit.

In regard to the capacity of the canal I will here reiterate what I said in my last annual report, the subject-matter being as applicable now as then :

"The capacity of a canal (other things being equal) may be determined by the number of lockages which can be made daily, and maintained through the navigable season. Now, allowing ten minutes for a lockage, which is more time than has been determined necessary by test trials, would make, for single locks, 144, and for double locks, 288 per day, or, for the average navigable season of 210 days, 30,240 lockages for single, and 60,480 for double locks.

"The total number of lockages in 1871 at Alexander's lock (double), three miles west of Schenectady, was 29,725, and at Lockport, also double, 21,082; showing that twice as many lockages may be made at said locks as were made that year. It will also be observed, from an examination of the lockages, that there is, comparatively, great uniformity in the daily and monthly number through the entire season, evidencing a uniformity in business, and not a rush in the spring and fall, as formerly. When the doubling of the remaining single locks on this division shall be completed, as they will be in the spring of 1874, and other works now contemplated finished, the Erie canal, with such uniformity in the business as above indicated, will be capable of doing double the amount that it has yet done. Allow the ratio of increase in the future to be the same as for the past three years, its capacity, based upon the above data, would not be reached under fifteen to eighteen years; but should it be found necessary or desirable to increase its capacity at or before such time, it can be done at comparatively small cost by making the locks of sufficient length to enable two of the present class of boats to be run and locked as one, carrying double the load, and, in consequence of being thus jointed, will enable them to pass



the short curves readily, requiring less help on the boats, and from twenty-five to thirty per cent less traction, in proportion to the load, than if run separately, as now.

"It cannot, in justice, be claimed that business has been diverted from the canal for want of capacity, nor can it be truthfully said that it has not taken all the business offered. Freights upon the lakes, from Chicago to Buffalo, doubled during the past year, while on the canal they remained the same. Does this not evidence a capacity of the canal, with its equipment, in excess of that of the lakes, with their equipment?"

"The president of the Buffalo board of trade, Mr. A. P. Wright, says: 'Our canal commerce, for the season last past, has proved the canals, even in their present unfinished state, a competitor without a rival for cheap transportation.' All which goes to show that the canal has not only capacity, but cheapness; yet, it does not do all the business, and never will, for the reason that other routes will take a portion, which portion is controlled by surrounding circumstances, existing at the time of shipment, more than the bare cost of transit."

It is evident, to my mind, that no expenditure of tens of millions for gunboat, or ship-locks, and enlargement of channel of the Erie canal, is required; but such an expenditure, merely as will complete the doubling of its locks now under contract, remove the remaining wall-benches, introduce the required supply of water on the western end of the Rome level, and complete the improvements now projected, and the whole properly cared for when done, to enable it to do all the business that may offer, not only cheaply, but beneficially to the state.

The railroads keep pace nearly with the demands for transport, and are better prepared now, than at any time heretofore, to meet the increased traffic which may be made upon them. The New York Central will have its double freight track completed for use, from Buffalo to New York, by next fall; the Erie is, also, increasing its facilities, and these, together with others, competing for the western trade, will continue in the future, as in the past, to take largely of the surplus products of that section, notwithstanding the fact that the cost by the water route is cheapest. With these things in view, and the further fact that the canal has capacity to transport more than 100,000,000 bushels of grain, annually, instead of 50,000,000 bushels as now, why the necessity of a ship-canal? or why burden the people of this state to create a subsidy to uphold the commercial interests of the lakes, the western cities and railroads centering in

them? Whenever it shall become apparent that the Erie canal needs increased capacity to do the business offered, there is no way such capacity can be doubled so cheaply as to make the locks of twice the length they now are, which would not probably cost over \$6,000,000, while a ship canal, and corresponding locks, would cost ten times that sum. There being no necessity, however, at the present time, to speculate as to the cost of any increase of capacity; but, on the contrary, it is deemed necessary only that so much be expended as to make the present channel and works available to their fullest extent to meet all demands upon them, and which can be accomplished without embarrassment to the people or detriment to the public interests.

Respectfully submitted,

JOHN D. FAY,

*Canal Commissioner.*



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**T A B L E S**

**ACCOMPANYING THE ANNUAL REPORT OF THE**  
**CANAL COMMISSIONERS.**

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1865	.....	815,660	1,577	228,622	0,279	13,935	907	88,808	2,930
1866	.....	645,168	1,530	59,934	1,569	18,477	744	49,304	1,945
1867	.....	489,170	1,195	44,463	1,170	18,546	897	105,625	2,773
1868	.....	433,577	1,020	88,681	2,331	30,008	910	44,932	1,158
1869	.....	609,258	1,401	42,310	1,113	21,459	975	87,668	1,846
1870	.....	1,094,378	2,493	39,146	1,030	40,227	828	29,460	735
1871	.....	898,671	2,066	51,708	1,961	30,010	1,499	91,226	2,539
1872	.....	943,877	2,169	84,104	2,213	38,047	1,275	69,733	1,768
1873	.....	738,707	1,813	190,620	2,627	22,800	1,141	57,224	1,477



1866	7,110	880	81,133	897	98,808	738	524	88
1867	7,396	924	104,598	1,078	98,848	735	.....	.....
1868	7,216	402	64,053	660	72,066	553	.....	.....
1869	7,585	948	48,827	503	83,185	635	.....	.....
1870	6,903	863	86,690	898	215,239	1,695	.....	.....
1871	74,459	9,307	122,008	1,258	156,956	1,268	.....	.....
1872	9,821	1,227	66,405	685	186,914	1,464	.....	.....
1873	6,777	847	38,146	404	121,863	900	.....	.....



## Statement of superintendents' expenditures—(Continued).

YEARS.	BLACK RIVER CANAL.		ONEIDA RIVER IMPROVEMENT. BALDWINSVILLE CANAL.		Total miles.	Total cost of repairs.	Total average per mile.
	Average per mile.		Average per mile.				
	Cost of repairs.		Cost of repairs.				
1827	.....	.....	.....	.....	400	\$232,473	\$588
1828	.....	.....	.....	.....	478	224,433	490
1829	.....	.....	.....	.....	500	224,433	509
1830	.....	.....	.....	.....	500	121,003	443
1831	.....	.....	.....	.....	500	180,973	361
1832	.....	.....	.....	.....	597	324,917	543
1833	.....	.....	.....	.....	597	372,789	624
1834	.....	.....	.....	.....	545	478,989	879
1835	.....	.....	.....	.....	545	428,138	785
1836	.....	.....	.....	.....	643	498,122	773
1837	.....	.....	.....	.....	643	451,774	703
1838	.....	.....	.....	.....	643	370,769	576
1839	.....	.....	.....	.....	694	460,688	664
1840	.....	.....	.....	.....	700	357,828	511
1841	.....	.....	.....	.....	700	459,560	656
1842	.....	.....	.....	.....	700	383,076	547
1843	.....	.....	.....	.....	700	484,899	693
1844	.....	.....	.....	.....	700	500,433	715
1845	.....	.....	.....	.....	700	510,355	729
1846	.....	.....	.....	.....	700	498,424	709
1847	.....	.....	.....	.....	700	674,777	964
1848	.....	.....	.....	.....	700	521,122	744
1849	.....	.....	.....	.....	763	626,950	823
1850	\$15,508	\$398	\$412	\$21	817	722,259	883
1851	21,516	448	2,084	104	887	824,533	929
1852	30,731	667	1,554	78	887	783,032	901
1853	26,830	488	3,255	162	857	940,265	1,082
1854	28,548	570	8,706	185	901	781,688	868
1855	34,000	578	2,482	124	901	616,014	684
1856	17,204	441	8,591	179	909	752,575	828
1857	15,179	155	2,797	140	917	873,721	948
1858	18,622	190	1,079	54	917	630,615	688
1859	24,926	255	.....	.....	816	356,966	412
1860	22,287	237	1,070	89	878	360,187	410
1861	23,402	249	450	22	924	342,817	371
1862	23,639	241	.....	.....	924	555,032	601
1863	20,455	217	692	53	.....	516,624	543
1864	21,646	230	499	42	.....	1,594,648	1,765
1865	48,498	515	.....	.....	.....	.....	.....



Add payments on account of canal repairs by the canal commissioners, exclusive of payments to contractors for repairs, viz.:

By Alexander Barkley, Erie canal.....	\$30,213 77	
By Wm. W. Wright Erie canal.....	9,839 60	
By R. W. Stroud Erie canal .....	10,690 66	
By J. D. Fay, Erie canal.....	14,399 74	
		\$65,143 77
By Alexander Barkley, Champlain canal.....		66,739 28
By Wm. W. Wright, Oswego canal .....	\$254 90	
By R. W. Stroud, Oswego canal.....	18,956 00	
By W. W. Wright, Cayuga and Seneca canal,	3,670 44	
By R. W. Stroud, Cayuga and Seneca canal,	3,594 09	
By W. W. Wright, Chemung canal .....	1,451 96	
By W. W. Wright, Chenango canal .....	1,058 49	
By R. W. Stroud Chenango canal.....	158 00	
By Alex. Barkley, Black River canal.....	1,580 00	
By John D. Fay, Genesee Valley canal....	504 92	
		31,228 80
		\$163,111 85

Total amount expended for ordinary repairs from  
1st October, 1872, to 30th September, 1873..... 1,356,872 18

Add payments on account of extraordinary repairs by  
canal commissioners, viz.:

Eastern division .....	\$602,895 36	
Middle division .....	326,480 80	
Western division.....	462,794 04	
		1,392,170 20

Total expended for ordinary and extraordinary re-  
pairs from October 1, 1872, to September 30, 1873, \$2,751,042 28

Expenditures under special acts, and those not included in the above,  
for years 1871, 1872 and 1873:

	1871.	1872.	1873.
Chenango extension.....	\$94,068 29	\$128,246 49	\$100,219 15
Champlain improvement.....	22,642 85	170,643 35	61,611 31
Champlain enlargement.....	17,800 00		255,948 82
Reconstruction Oneida Lake canal.....	51,614 45	5,710 00	500 00

*Exhibiting the date of the opening and the closing of the Hudson river, and the number of days open; also the time of commencement and close of each navigable season of canals, and the number of days of navigation since 1824; also, the date of the opening of Lake Erie since 1827.*

OPENING AND CLOSING OF THE HUDSON RIVER.			COMMENCEMENT AND CLOSE OF NAVIGATION OF ERIE CANAL.			Opening of the lake.
River open.	River closed.	Days open.	Canal open.	Canal closed.	Navigable days.	
March 3, 1834	January 5, 1834	309	April 30, 1834	December 4	219	
March 6, 1835	December 13, 1835	283	April 12, 1835	December 6	238	
March 10, 1836	December 13, 1836	302	April 20, 1836	December 18	243	
March 20, 1837	November 25, 1837	251	April 22, 1837	December 18	241	April 21, 1837
March 8, 1838	December 23, 1838	290	March 27, 1838	December 20	269	April 1, 1838
April 1, 1839	January 14, 1839	296	May 2, 1839	December 17	230	May 10, 1839
April 15, 1840	December 23, 1840	283	April 30, 1840	December 17	242	May 5, 1840
March 15, 1841	December 6, 1841	262	April 26, 1841	December 1	230	May 8, 1841
March 25, 1842	December 21, 1842	289	April 25, 1842	December 21	241	April 27, 1842
March 31, 1843	December 13, 1843	277	April 19, 1843	December 12	238	April 23, 1843
March 31, 1844	December 13, 1844	301	April 17, 1844	December 12	240	April 6, 1844
March 31, 1845	December 15, 1845	298	April 17, 1845	December 30	230	May 8, 1845
March 25, 1846	November 30, 1846	344	April 15, 1846	November 26	216	April 27, 1846
April 4, 1847	December 7, 1847	261	April 10, 1847	November 9	234	May 16, 1847
March 19, 1848	December 14, 1848	285	April 12, 1848	December 9	238	March 21, 1848
March 25, 1849	November 18, 1849	286	April 20, 1849	December 16	241	April 17, 1849
March 25, 1850	November 16, 1850	280	April 30, 1850	December 9	238	April 27, 1850
March 24, 1851	November 16, 1851	280	April 30, 1851	December 30	231	April 14, 1851
March 13, 1852	December 10, 1852	308	May 1, 1852	November 28	232	March 7, 1852
March 18, 1853	December 17, 1853	273	April 28, 1853	November 30	214	May 6, 1853
March 18, 1854	December 3, 1854	278	April 28, 1854	November 26	222	March 14, 1854
March 18, 1855	December 3, 1855	283	April 15, 1855	November 29	238	April 3, 1855
March 18, 1856	December 14, 1856	275	April 16, 1856	November 25	224	April 11, 1856
March 7, 1857	December 35, 1857	303	May 1, 1857	November 30	214	April 23, 1857
March 22, 1858	December 27, 1858	292	May 1, 1858	December 9	233	April 9, 1858
March 19, 1859	December 27, 1859	286	May 1, 1859	December 5	219	March 35, 1859
March 10, 1860	December 17, 1860	302	May 1, 1860	December 11	204	March 25, 1860
March 25, 1861	December 14, 1861	283	April 22, 1861	December 5	235	April 2, 1861
March 28, 1862	December 21, 1862	293	April 15, 1862	December 16	239	April 20, 1862
March 28, 1863	December 31, 1863	270	April 30, 1863	December 20	245	April 14, 1863
March 17, 1864	December 8, 1864	295	May 1, 1864	December 3	217	April 29, 1864
March 17, 1865	December 30, 1865	268	May 1, 1865	December 10	234	April 21, 1865
March 11, 1866	December 14, 1866	248	May 5, 1866	December 4	214	May 2, 1866
March 27, 1867	December 27, 1867	303	May 6, 1867	December 15	223	April 27, 1867

*Table exhibiting the date of the opening and closing of the Hudson river, etc.—(Continued).*

OPENING AND CLOSING OF THE HUDSON RIVER.			COMMENCEMENT AND CLOSE OF NAVIGATION OF ERIE CANAL.			Opening of the lake.
River open.	River closed.	Days open.	Canal open.	Canal closed.	Navigable days.	
March 30, 1858.....	December 17, 1858.....	273	April 28, 1858.....	December 8.....	225	April 15, 1858
March 13, 1859.....	December 10, 1859.....	273	April 15, 1859.....	December 12.....	242	April 7, 1859
March 6, 1860.....	December 14, 1860.....	283	April 25, 1860.....	December 12.....	232	April 17, 1860
March 5, 1861.....	December 23, 1861.....	294	May 1, 1861.....	December 10.....	224	April 13, 1861
April 4, 1862.....	December 19, 1862.....	250	May 1, 1862.....	December 10.....	224	April 15, 1862
April 3, 1863.....	December 11, 1863.....	252	May 1, 1863.....	December 9.....	223	April 8, 1863
March 11, 1864.....	December 12, 1864.....	277	April 30, 1864.....	December 8.....	223	April 13, 1864
March 22, 1865.....	December 16, 1865.....	270	May 1, 1865.....	December 12.....	226	April 26, 1865
March 20, 1866.....	December 15, 1866.....	270	May 1, 1866.....	December 12.....	226	April 26, 1866
March 26, 1867.....	December 8, 1867.....	257	May 6, 1867.....	December 20.....	229	April 21, 1867
March 24, 1868.....	December 5, 1868.....	262	May 6, 1868.....	December 7.....	217	April 19, 1868
March 5, 1869.....	December 9, 1869.....	248	May 6, 1869.....	December 10.....	218	May 1, 1869
April 31, 1870.....	December 17, 1870.....	261	May 10, 1870.....	December 8.....	213	April 16, 1870
March 12, 1871.....	November 29, 1871.....	263	May 24, 1871.....	December 1.....	220	April 1, 1871
April 7, 1872.....	December 9, 1872.....	247	May 13, 1872.....	December 1.....	202	May 6, 1872
April 16, 1873.....	November 22, 1873.....	221	May 15, 1873.....	December 5.....	205	April 29, 1873

## RATES OF TOLL, 1873.

ESTABLISHED BY THE CANAL BOARD ON PERSONS AND PROPERTY TRANSPORTED ON THE NEW YORK STATE CANALS, TO TAKE EFFECT ON THE OPENING OF NAVIGATION, ADOPTED JANUARY 21, 1873, AND TRANSMITTED TO LEGISLATURE FOR APPROVAL.

*Toll is to be computed upon the Weight ("1,000 pounds per mile") of all articles contained in the following list, unless otherwise stated, opposite to the articles excepted.*

## A.

	cts.	m.	fr.
Acid, sulphuric .....	0	2	0
Agricultural implements, going from tide-water .....	0	1	5
Articles not enumerated, going toward tide-water .....	0	2	0
On the same, going from tide-water .....	0	1	5
Agricultural productions of the United States, not particularly specified ..	0	2	0
Apples .....	0	2	0
Ashes, pot and pearl .....	0	2	0
Ashes, leached .....	0	0	5

## B.

Bacon .....	0	1	0
Barley .....	0	1	5
Barrels, empty, transported in boats .....	0	1	0
Barrels, empty, transported in rafts .....	0	5	0
Bars of iron .....	0	1	5
Barytes .....	0	1	5
Beans .....	0	1	5
Bedstead stuff (see <i>Lumber No. 3</i> ) .....	0	2	0
Beef, salted .....	0	1	5
Bleaching powders, going from tide-water .....	0	1	0
Bloom iron, going from tide-water .....	0	0	5
Boat knees (see <i>Lumber No. 3</i> ) .....	0	2	0
Boats, <i>used chiefly</i> for transportation of passengers upon <i>all canals</i> , per mile,	4	0	0
On the same, if they elect to commute for tolls upon passengers .....	3	0	0
Boats, <i>used chiefly</i> for transportation of property, per mile .....	2	0	0
On the same, if they elect to commute for tolls upon passengers .....	2	3	0
Boats registered before July 1st, 1862, whose bows do not conform to regulation No. 40, per mile .....	3	0	0
Bolts, stave, if carried in boats .....	0	1	0
Bolts, stave, if carried in rafts .....	0	5	0
Bones .....	0	0	5
Boxes, stuff for (see <i>Lumber No. 3</i> ) .....	0	2	0
Bran .....	0	1	0
Brick .....	0	1	0
Brimstone .....	0	1	0
Broom handles (see <i>Lumber No. 3</i> ) .....	0	2	0
Brush backs (see <i>Lumber No. 3</i> ) .....	0	2	0
Brush handles (see <i>Lumber No. 3</i> ) .....	0	2	0
Buffalo skins .....	0	2	5
Butter .....			
Butts, stave, if carried in boats .....	0	1	5
Butts, stave, if carried in rafts .....	0	5	0

## C.

Cabinet ware .....	0	1	5
Carboys .....	0	2	0
Carts .....	0	2	0

	cts.	m.	fr.
Car axles.....	0	1	0
Car wheels (iron).....	0	0	5
Carriages and sleighs.....	0	2	0
Casks, empty, transported in boats.....	0	1	0
Casks, empty, transported in rafts.....	0	5	0
Castings, all iron castings.....	0	1	5
Cattle, alive.....	0	2	0
Cedar posts (see <i>Lumber No. 2</i> ), per 1,000 feet per mile.....	0	5	5
Cedar, red (see <i>Lumber No. 2</i> ), per 1,000 feet per mile.....	0	5	5
Cement, fire-proof.....	0	1	0
Chair stuff, (see <i>Lumber No. 3</i> ).....	0	2	0
Charcoal.....	0	0	5
Cheese.....	0	1	5
Cider.....	0	1	5
Clay.....	0	1	0
Clover seed.....	0	2	0
Coal, anthracite.....	0	0	5
Coal, bituminous.....	0	0	5
Coal oil.....	0	0	5
Coal tar and products thereof.....	0	0	5
Coffee.....	0	1	0
Copper ore.....	0	1	0
Copper, pig and smelted.....	0	1	0
Corn.....	0	1	5
Corn meal.....	0	1	5
Cotton.....	0	1	0
Crockery.....	0	1	0

## D.

Deer skins.....	0	2	5
Domestic distilled spirits.....	0	1	5
Domestic cottons.....	0	1	5
Domestic woolens.....	0	1	5

## E.

Earth.....	0	0	5
Esculent roots.....	0	1	0

## F.

Fellies (see <i>Lumber No. 2</i> ).....	0	2	0
Fire-proof cement.....	0	1	0
Fire brick.....	0	1	0
Fish, salted, going from tide-water.....	0	1	0
Flax seed.....	0	2	0
Flour.....	0	1	5
Furniture, cabinet ware and chairs.....	0	1	5
Furniture, for stoves, not cast iron.....	0	1	5
Furs, and skins of animals producing furs.....	0	2	5

## G.

Gas-pipes.....	0	1	0
Glass ware.....	0	1	5
Grass seed.....	0	2	0
Grease.....	0	1	5
Gunstocks (see <i>Lumber No. 3</i> ).....	0	2	0
Gypsum, ground and unground.....	0	1	0

## H.

Hand-spikes (see <i>Lumber No. 3</i> ).....	0	2	0
Hay, pressed.....	0	0	5
Heading, undressed, transported in boats.....	0	1	0
Heading, dressed or partly dressed.....	0	1	0
Heading, transported in rafts.....	0	5	0

	cts.	m.	fr
Hemp, going toward tide-water.....	0	1	0
Hides.....	0	1	5
Hogs, alive.....	2	2	
Hops.....	2	0	
Hop poles (see <i>Lumber No. 3</i> ).....	0	2	0
Hop poles, transported in rafts.....	0	5	0
Hoop poles (see <i>Lumber No. 3</i> ).....	0	2	0
Hoop poles, transported in rafts.....	0	5	0
Hoops, rived.....	0	2	0
Horses.....	0	3	0
Horses, used exclusively for towing boats and other floats, exempt from toll.			
Horse shoes.....	0	0	5
Hobs (see <i>Lumber No. 3</i> ).....	0	2	0

## I.

Ice.....	0	0	5
Iron, in sheets, bars and bundles.....	0	1	5
Iron ore.....	0	0	5
Iron, bloom and pig, going toward tide-water.....	0	1	0
Iron, bloom and pig, going from tide-water.....	0	0	5
Iron, boiler.....	0	1	5
Iron, bridge and railing.....	0	1	5
Iron bolts.....	0	1	5
Iron's sales.....	0	1	5

## J.

Junk.....	0	1	5
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## L.

Lard.....	0	1	0
Lard oil.....	0	1	0
Last blocks (see <i>Lumber No. 3</i> ).....	0	2	0
Lath (see <i>Lumber No. 1</i> ).....	0	2	0
Lath (see <i>Lumber No. 2</i> ), per 1,000 feet per mile, surface measure.....	0	5	5
Lath (see <i>Lumber No. 3</i> ).....	0	2	0
Lead, bar and pig, going toward tide-water.....	0	0	5
Leather.....	0	1	5
Lime, manufactured.....	0	1	0
Lime, water.....	0	1	0
Limestone.....	0	0	5
Looking-glass backs (see <i>Lumber No. 3</i> ).....	0	2	0

## LUMBER No. 1.\*

*Transported by boats, by weight, per 1,000 pounds per mile.*

White pine, white wood, cherry, bass wood, cedar boards, plank, scantling, and on all sidings, lath and other sawed stuff less than one inch thick (except such as are enumerated in <i>Lumber No. 3</i> ).....	0	2	0
Oak, hickory, beech, sycamore, black walnut, butternut, maple, ash, elm, fir, tamarack and yew.....	0	1	5
Hemlock and spruce.....	0	1	0

## LUMBER No. 2.\*

*Transported in boats by measurement, per 1,000 feet per mile.*

Boards, planks, scantling, railroad ties and sawed timber, reduced to inch measure, and all siding, lath and other sawed stuff, less than one inch thick (except such as is enumerated in <i>Lumber No. 3</i> ), tolls computed on surface measure; and all kinds of red cedar, cedar posts, estimated that a cord, after deducting for openings, will contain 1,000 feet....	0	5	5
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\*LUMBER shall not be cleared by measurement when carried in a boat having other articles on board paying toll by weight, but such lumber shall, in all such cases, be also cleared by weight.

When a cargo is composed entirely of lumber, which can be cleared by weight or measure, the whole of such cargo shall be cleared by measurement or by weight, as the shipper or master may elect, and in no case shall a portion of any such cargo be cleared by measurement and the other portion by weight.



	cts.	m.	fr.
Hemlock, per 1,000 feet, per mile, when not weighed .....	0	3	0
Lumber No. 2, transported in rafts, per 1,000 feet, per mile.....	2	5	0

## LUMBER No. 3.\*

*Transported in boats by weight, per 1,000 pounds, per mile.*

Sawed lath of less than ten feet in length, split lath, hoop poles, hand spikes, rowing oars, broom handles, spokes, hubs, treenails, fellies, boat and ship knees, plane stocks, pickets for fences, railroad ties, last blocks, stuff, manufactured or partly manufactured, for boxes; chairs and bedsteads, hop poles, brush handles, brush backs, looking-glass backs, gun stocks, plow beams and plow handles.....	0	2	0
Sawed stuff for window blinds, not exceeding one-fourth of an inch in thickness .....	0	5	0

## M.

Mahogany .....	0	1	5
Manure .....	0	0	5
Marl .....	0	0	5
Merchandise, non-enumerated.....	0	1	5
Molasses.....	0	1	0
Moose skins .....	0	2	5

## N.

Nails.....	0	0	5
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## O.

Oats .....	0	1	5
Oil cake.....	0	1	5
Oil meal .....	0	1	5
Onions .....	0	1	0

## P.

Passengers, over ten years of age, per mile.....	0	0	5
Petroleum or earth oil, crude and refined.....	0	0	5
Peas .....	0	1	5
Peat .....	0	0	5
Pickets for fences (see <i>Lumber No. 3</i> ).....	0	2	0
Pig copper .....	0	1	0
Pig iron, going from tide-water .....	0	0	5
Pig iron, going toward tide-water .....	0	1	0
Plane stocks (see <i>Lumber No. 3</i> ).....	0	2	0
Plaster, calcined, or plaster of paris, going from tide-water .....	0	1	0
Plow beams (see <i>Lumber No. 3</i> ).....	0	2	0
Plow handles (see <i>Lumber No. 3</i> ) .....	0	2	0
Pork, salted .....	0	1	5
Posts, split and round, not exceeding eight feet in length, carried in boats, per M, per mile .....	2	0	0
Potatoes .....	0	2	0
Powder and gunpowder .....	0	4	0

## R.

Rags .....	0	1	5
Railroad chairs .....	0	1	0
Railroad iron .....	0	1	0
Railroad ties (see <i>Lumber Nos. 2 and 3</i> ).			

\* LUMBER shall not be cleared by measurement when carried in a boat having other articles on board paying toll by weight, but such lumber shall, in all such cases, be also cleared by weight.

When a cargo is composed entirely of lumber, which can be cleared by weight or measure, the whole of such cargo shall be cleared by measurement or by weight, as the shipper or master may elect, and in no case shall a portion of any such cargo be cleared by measurement and the other portion by weight.

	cts.	m.	fr.
Rails for fences, not exceeding fourteen feet in length, carried in boats, per M, per mile .....	2	0	0
On the same if carried in rafts, per M, per mile.....	8	0	0
Rice, going from tide-water .....	0	1	0
Roots, esculent.....	0	1	0
Rowing oars (see <i>Lumber No. 3</i> ) .....	0	2	0
Rye.....	0	1	5
S.			
Sal soda, going from tide-water.....	0	1	0
Salted fish, going from tide-water.....	0	1	0
Salt, foreign .....	0	2	5
Salt, manufactured in this State .....	0	1	0
Sand .....	0	0	5
Sawed stuff (see <i>Lumber Nos. 2 and 3</i> ).....			
Sawdust .....	0	0	5
Scrap iron .....	0	0	5
Sheep, alive.....	0	2	0
Shingles, in boats, per 1,000 pounds, per mile.....	0	1	5
Shingles, in boats, per M, per mile .....	0	0	5
Shingles, per M, per mile, in rafts.....	0	4	0
Ship knees.....	0	2	0
Ship knees, transported in rafts.....	0	5	0
Ship stuffs .....	0	1	5
Shooks, stave .....	0	1	0
Shrubbery and trees .....	0	4	0
Siding (see <i>Lumber No. 1</i> ).....	0	2	0
Siding (see <i>Lumber No. 5</i> ), per 1,000 feet, surface measure .....	0	5	5
Skins of animals producing furs .....	0	2	5
Slate.....	0	0	5
Sleighs .....	0	2	0
Soda ash .....	0	1	0
Spikes.....	0	0	5
Split posts and round, not exceeding eight feet in length, carried in boats, per M, per mile .....	2	0	0
On the same, if carried in rafts, per M, per mile.....	8	0	0
Spokes (see <i>Lumber No. 3</i> ) .....	0	2	0
Staves and heading, sawed, cut and dressed or partly dressed, shooks and stave bolts and butts, not exceeding four feet and one-half in length, transported in boats .....	0	1	0
On the same, if transported in rafts.....	0	5	0
Steel .....	0	1	5
Stone, for the manufacture of lime .....	0	0	5
Stone, wrought.....	0	1	0
Stone, unwrought and partly wrought.....	0	0	5
Stoves.....	0	1	5
Straw, pressed, and any pressed vegetable substance used for the manufacture of paper or paper pulp.....	0	0	5
Sugar .....	0	1	0
T.			
Tallow .....	0	1	5
Tan bark, per cord, per mile, carried in boats.....	0	5	0
Tan bark, per cord, per mile, carried in rafts .....	2	0	0
Tan bark, ground, per 1,000 pounds, per mile.....	0	2	5
Tar .....	0	1	5
TIMBER, per 100 cubic feet per mile, transported in boats:			
Squared and round, other than hemlock.....	0	6	0
Squared and round, hemlock.....	0	4	0
Squared and round (all kinds), transported in rafts.....	1	0	0
Sawed timber (see <i>Lumber No. 2</i> ), per 1,000 feet, per mile.....	0	5	5
Tin plate, going from tide-water.....	0	0	5
Tobacco, manufactured, going toward tide-water .....	0	1	0
Tobacco, going from tide-water .....	0	1	5
Treenails (see <i>Lumber No. 3</i> ) .....	0	2	0

	cts.	m.	fr.
Trees and shrubbery .....	0	4	0
Turnips .....	0	1	0
Turpentine .....	0	1	5

## V.

Varnish .....	0	1	5
Vinegar .....	0	1	5

## W.

Wagon .....	0	2	0
Water lime, going from tide-water .....	0	1	0
Water lime, going toward tide-water .....	0	1	0
Water pipes .....	0	1	0
Wheat, .....	0	1	5
Window blinds, sawed stuff for (see <i>Lumber No. 3</i> ) .....	0	5	0
Window sashes .....	0	5	0
Wood for fuel, per cord, per mile .....	0	5	0
Wood for fuel, per cord, per mile, carried in rafts .....	2	0	0
Wood used in the manufacture of salt, per cord, per mile .....	0	5	0
Wool .....	0	1	0

## STATE OF NEW YORK:

CANAL DEPARTMENT, ALBANY, *May 3, 1870.* }

I certify the foregoing to be a correct list of the rates of toll this day established by the Canal Board, to take effect on the opening of navigation.

JAMES A. BELL, *Auditor.*

## REGULATIONS RELATIVE TO LUMBER.

The collectors of canal tolls at Rochester, Syracuse and Utica, where a boat having on board sawed lumber or cord wood which has been cleared, either by count, measurement or *weight*, is unloaded at either of said offices, and the collectors of canal tolls at Waterford, West Troy and Albany, in every instance where a boat having on board sawed lumber or cord wood shall pass into the Hudson river, or where the cargo is unloaded at either of said offices, which has not been measured or counted by either of them, shall require the master or owner to produce the certificate of a city inspector or measurer before a new clearance is granted to said boat, stating the count or measurement of the quantity of each kind of lumber in feet, and the number of cords of wood of which said cargo was composed; and every such inspector or measurer may give his certificate upon his own personal inspection of the count or measurement; or he may give his certificate upon the written statement of the owner or consignee of said wood or lumber, which statement shall, in all cases, be accompanied with an affidavit of the measurement or count from a person of good character, and a competent measurer of lumber or wood, in the following form, viz.:

I, \_\_\_\_\_, of \_\_\_\_\_, do swear that I have measured the entire cargo of the boat \_\_\_\_\_, of \_\_\_\_\_, of which \_\_\_\_\_ is master, and that the following is a true statement or bill of the number of pieces, and the quantity in board measure where pieces were not less than one inch thick, and the number of pieces and the quantity in surface measure where the pieces were less than one inch thick, of each kind of lumber comprising said cargo, viz.:

[Here give the quantity of *each kind* of lumber in feet.]

And I do further swear, that where the \_\_\_\_\_ were not of uniform length or width, I measured each piece, and have given the true contents of the whole, having made no deduction for defective lumber.

Sworn before me, this \_\_\_\_\_ }  
day of \_\_\_\_\_, 18 \_\_\_\_ }

And the collector may also require the master of the boat to add his oath to the certificate of the lumber inspector, as follows :

I, A. B., master of the boat , of , do swear, that no part of the lumber embraced in the bill of lading and clearance was taken from said boat, from the time said clearance and bill of lading were given to me, until the same was unloaded at , on the day , 18 .

[If lumber has been previously unloaded from the same cargo, state the *kind*, quantity and place of unloading.]

Sworn before me this  
day of , 18 . }

And the certificate of the said city inspector shall certify on what evidence his certificate is given, and such certificate and evidence shall be carefully preserved in the collector's office; and in every instance where, in the opinion of the collector, this certificate cannot be furnished, or where he shall have any doubts that such certificate includes the whole amount of said cargo, he shall administer an oath to the master or owner of the boat, in relation to the correctness of his clearance.

The bill of lading of each boat loaded with lumber, and *destined to New York*, must be verified in the following manner, to entitle such boat to a clearance, viz. :

1. Where the master does not superintend the loading of the boat, the shipper, or some person who has such superintendence, must swear to the correctness of the bill of lading, as follows :

I, of the town of , do swear that I superintended the loading of the boat , of , of which is master, at , and that the above is a true bill of lading of said boat, and gives the number of feet in board measure, where the boards are not less than one inch thick, and the number of feet in surface measure, where the boards are less than one inch thick; and that no articles of freight of any kind, other than those specified in said bill, were put on board of said boat up to the time took charge of the boat as master.

Sworn before me this  
day of , 18 . }

The master of the boat will be required to make the following oath :

I, A. B., master of the boat , of , do swear, that no addition has been made to the cargo of said boat since the bill of lading and affidavit annexed were delivered to me, and according to the best of my knowledge and belief, the said bill represents truly all the freight on board of said boat.

Sworn before me this  
day of , 18 . }

2. Where the master superintends the loading of the boat, the bill of lading may be signed by the shipper, and be verified by the oath of the master, as follows :

I, , master of the boat , of , do swear that I superintended the loading of the boat , of , at , and that the above is a true bill of lading of said boat, and gives the number of feet in board measure, where the boards are not less than one inch thick, and the number of feet in surface measure, where the boards are less than one inch thick, and that no articles of freight of any kind are on board of said boat, other than those specified in the bill of lading now presented to obtain a clearance.

Sworn before me, this  
day of , 18 . }

Each boat destined to New York shall be furnished with a duplicate of its bill of lading, which must be left with the collector at the place where it enters the Hudson river.

In the measurement of timber to be floated on the canal, bark adhering to the wood and refuse stuff are to be estimated as forming part of the timber, and to be rated accordingly; and the inspectors are instructed to make their measurements according to these directions.

Whenever cord wood or sawed lumber shall be delivered to more than one owner or consignee, from the same cargo, the master of such boat shall deliver to a canal boat inspector a statement from each owner or consignee of the quantity in feet of each kind of lumber, and the number of cords of wood received by him from such cargo, and such statement shall be accompanied by an affidavit such as is first above prescribed, omitting the words "entire cargo," and substituting therefor "all of that portion of said cargo delivered to (here insert the owner or consignee's name)," and every master who shall violate the provisions of this regulation shall forfeit the sum of ten dollars.

Whenever a cargo of cord wood or sawed lumber, or any portion thereof, is unloaded at a place where there is no collector, the master of said boat shall attend to the measurement of said lumber or wood when it is delivered, and it shall be the duty of said master to deliver to the nearest collector, or the collector next in order on his passage, a statement showing the kind or kinds and quantity of all the lumber in feet, and the number of all the cords of wood so unloaded, which statement shall be sworn to before the collector to whom it is delivered; and every master who shall violate the provision of this regulation shall forfeit the sum of ten dollars.

#### INFORMATION NECESSARY FOR THOSE WHO NAVIGATE THE CANALS.

##### BILL OF LADING.

Every master of a boat conveying property on a canal shall exhibit to the several collectors, hereafter mentioned, a just and true account or bill of lading of such property, signed by himself and by the consignee thereof, containing:

1. The name of each place on the canal where any portion of such property was shipped, and of the place for which it is intended to be cleared.

2. A statement of the names, description and weight of all the articles of such property, on which toll is charged by the ton, of the number of articles on which toll is charged by the number, and of the feet of each article on which toll is charged by the foot.

3. A specification of the weight or quantity of each article, where a different rate of toll is charged on different articles, on which toll is so computed.

4. No clearance of a boat and cargo shall be granted or issued by any collector of canal tolls, except upon the production to him of a bill of lading containing the above particulars.

If, on the passage, other articles are taken on board, the master must enter the number or weight of such articles on the bill.

☞ Property taken on within one mile of a collector's office, must pay toll at and be cleared from that office.

☞ Every master should know the contents of his cargo, so that he can, if required, verify his bill of lading by his oath.

☞ Masters who transport lumber by the pound or foot, or wood by the cord, if they take the estimate of the owner, should require him to give a bill signed by himself, and for the accuracy of which he is willing to be responsible; otherwise the master or his boat, being responsible for the treble toll to the State, may be without

remedy against the person who makes the erroneous shipping bill. [For the penalties for false bills, see 1 R. S., 1st ed., sections 123, 124 and 125.]

#### CLEARANCE.

Every boat must have a clearance, and no boat can proceed beyond the place cleared to, or unlade any article before or after its arrival there until the clearance is delivered to the collector. If there be no collector there, the clearance is to be left with the last collector. For neglecting to deliver the clearance the fine is ten dollars. The master can have a certified copy for sixpence, if not over 200 words, counting each figure as a word; if over 200 words, for one shilling, and no more in any case. Copies of clearances to get toll refunded, where a collector makes a mistake, are to be furnished without charge; property transferred from one boat to another must in all cases be recleared. A boat or float whose clearance is lost, or is claimed to be lost, must be detained until it reclear and pay the toll for the whole voyage, or produce a duplicate clearance from the office where its first clearance is claimed to have been issued. If the master or owner elects to reclear, no toll will be refunded in consequence of having paid the toll a second time, unless the original clearance is produced.

#### RAFTS.

Every raft navigating at night must carry a conspicuous light on the forward end of the same, and every raft moored or tied up is, at all times during the night, to have a conspicuous light at each end of each tow, near the outer corners thereof. Penalty for each offense, ten dollars.

#### WEIGH LOCK.

*Light Weight.*—A new boat must get its light weight within thirty days after its first clearance, or be subject to a penalty of five dollars at each weigh lock. After a new boat gets its light weight, it may continue to run, not to exceed four years, without getting another light weight, and without incurring a penalty for the omission to do so, unless it be ordered again to weigh light; or, where the weight of a boat has been *lessened* since a light weight was obtained.

#### RELATIVE TO REFUNDING.

*More by Lock.*—If a master be dissatisfied with an addition by one weigh lock, he should go into another; if the second lock differs from the first, and he is still dissatisfied, he may, if he chooses, go into a third, if there be one. If he passes the *third without weighing*, nothing will be refunded on account of the addition by the *first*. If he weighs in the third, the average of the locks will determine whether he shall have toll refunded or pay more.

*Less by Lock.*—Although a weigh lock may show a cargo to weigh less than the bill of lading, before toll will be refunded on the difference the master must prove what *particular article*, and *how much of it*, is entered wrong on his bill, and that every other article is entered right. The cargo must be weighed in at least two weigh locks.

Toll will not be refunded on an addition made by a weigh lock in consequence of using the light weight of a previous year, except in case of addition made to a cargo under the first clearance for the season, and then only when such first clearance shall have been taken at a place where there is *no weigh lock*.

## ADDITION TO BOAT.

Before toll will be refunded in consequence of an increase in the weight of a boat, by an addition made to it after a light weight has been obtained, *a new light weight* must be taken. Affidavits in relation to any increase to the weight of a boat, without such new light weight will not be received. Tolls will only be refunded on the first cargo after such increase in the weight of a boat was made.

## BOAT AND CARGO STOPPED SHORT OF POINT CLEARED TO.

*Any collector* will refund in a case where a boat for any reason cannot proceed, on the delivery of the original clearance, and the affidavit of the master that he paid the toll on the boat and cargo, and that he is the owner of the boat, or runs the same on his own account, or that he is authorized by the person or persons who did pay it (which authority shall be in writing, signed by such person or persons, and deposited with the collector), to receive and receipt for the same.

## MIXED CARGO.

Any addition by weigh lock to a mixed cargo will be upon articles subject to the *highest rate of toll*, and going the *farthest distance*, unless the master furnishes the collector *proof* of the specific article which caused the addition.

## NEW BOATS.

The owner of every NEW BOAT must file with a collector a "certificate of registry," containing the name or names of the owners, their place of abode, the name of the boat, and its hailing place; also stating the tonnage of the boat, and whether it be a steamer, packet, line, lake, bull-head, open scow, or decked scow. If the owners reside out of the State, it is to be signed by the master. If the master of a boat owned out of the State be changed, the new master must file another certificate. No boat registered since the first day of July, 1862, whose bow does not conform to the 40th regulation of the Canal Board, will be allowed, under any circumstances, to navigate the canals of the State.

## NAME OF BOAT.

The name of the boat, with the hailing place, as it is registered, must be PAINTED in letters at least four inches in height, on some CONSPICUOUS and PERMANENT part of the OUTSIDE of the boat. No boat will hereafter be permitted to change its name or its hailing place; and for painting a new name or hailing place, which is considered part of the name, or for reporting a boat by a name different from the registered name, to any collector, the penalty is ten dollars.

When a person sells a boat, unless he requires the purchaser to file a certificate of "change of ownership" with a collector, he is still deemed in law the owner, and is liable for tolls and fines.

## INJURING OR OBSTRUCTING THE CANALS—PENALTIES THEREFOR.

For using a setting pole pointed with iron or other metal; for obstructing the canal by mooring a float, sinking a vessel, timber, stone, etc.; and for omitting to have a knife on the stem of the boat, there is, in the first case, a penalty of five dollars, and in the other two, of ten dollars each.

## DEDUCTION FOR WATER.

No great deduction shall be made from the weight of any boat and cargo, on account of *water in the boat*, by any weigh-master weighing a loaded boat, than the amount of the water *credited and registered* to said boat when *last weighed light*.

## BOATS AT NEW YORK AND BUFFALO.

Masters of boats going to New York must, on their return, produce to the collector where the boat enters the canal from the Hudson river, full and satisfactory evidence of the correctness of the clearance and bill of lading of the down cargo, and that the full tolls have been paid thereon. If this be not done, the return clearance must be refused in all cases; and such boats as do not clear at Buffalo must bring back the certificate of the canal collector in Buffalo as to the correctness of the up cargo, or the collector at Tonawanda will not clear them.

## HEIGHT OF BOATS ALLOWED ON THE ERIE, OSWEGO, AND CAYUGA AND SENECA CANALS.

No boat or other craft whose height or distance from the water line of such boat or craft to the top thereof shall exceed eleven feet and three inches; and no loaded boat or other craft whose cargo or other part thereof is so arranged or placed on such boat or craft, so that the top or extreme height of the same, shall exceed eleven feet and three inches from the water line of such laden boat or craft; and no steamboat, tug or other craft propelled by steam, whose height when the top of the dock, machinery, fixtures, or other apparatus, shall exceed eleven feet and three inches, shall be allowed or permitted to navigate either of the above named canals.

## HEIGHT OF BOATS ALLOWED ON THE CHEMUNG CANAL.

No boat or other craft whose height or distance from the water line of such boat or craft to the top thereof shall exceed nine feet; and no loaded boat or other craft whose cargo, or any part thereof, is so arranged or placed on such boat or craft, so that the top, or extreme height of the same shall exceed nine feet from the water line of such laden boat or craft; and no steamboat, tug or craft propelled by steam, whose height when the top of the deck, machinery, fixtures or other apparatus, shall exceed nine feet, shall be allowed or permitted to navigate the Chemung canal.

## OVERDRAFT OF WATER.

*No boat drawing more water than the limit prescribed by the Canal Board shall be cleared by any collector; and it shall be the duty of every collector, superintendent, inspector and weigh-master to cause every boat found violating the regulations on this subject to be so far unloaded as to bring her within the prescribed limits, and in every case where a boat is so unloaded, the fact shall be entered on her clearance, with a statement of the portion of her cargo taken off; and if such boat shall be found to exceed the said draft, her master or owner shall be subject to a penalty of twenty-five dollars, to be imposed and collected by any and every collector, superintendent, inspector and weigh-master, who shall at different times and places detect such overdraft.*

## COMMISSIONERS OF THE CANAL FUND.

[The Commissioners of the Canal Fund have the superintendence of the Canal Fund, and of the Canal Debt.]



John C. Robinson, Lieutenant-Governor ; D. Willers Jr. Secretary of State ; Nelson K. Hopkins, Comptroller ; Thomas Raines, Treasurer ; Daniel Pratt, Attorney-General.

#### CANAL COMMISSIONERS.

[The Canal Commissioners have the general charge of the public works, of the construction of new canals, and of the repairs of the completed canals.]

Alexander Barkley, in charge of Eastern Division, viz. : The Erie canal, from Albany, including Albany basin, to east bank of the Oneida Lake canal ; Champlain canal ; Glen's Falls feeder and the Black River canal and feeder, and improvement of Black river and reservoirs—315 miles.

Reuben W. Stroud, Syracuse, in charge of Middle Division, viz. : The Erie canal, from the east bank of the Oneida Lake canal to the east line of the county of Wayne, including the several feeders ; Oswego canal ; Cayuga and Seneca canal ; Cayuga inlet ; Chenango canal ; Seneca River towing-path ; Oneida River improvement ; Chemung canal and feeder ; Crooked Lake canal ; Oneida Creek feeder ; Oneida Lake canal ; Baldwinsville canal—329 miles.

James Jackson, Jr., Lockport, in charge of Western Division, viz. : The Erie canal, from the east line of the county of Wayne to Buffalo, including the basins at Buffalo, and the Genesee Valley canal—280 miles.

#### STATE ENGINEER AND SURVEYOR.

Sylvanus H. Sweet prescribes duties of and assigns divisions of canals to engineers ; visits and inspects canals ; prepares surveys, maps, plans, estimates, etc., in the construction or improvement of a canal, etc., etc.

#### THE CANAL BOARD.

The Canal Board consists of the Commissioners of the Canal Fund, the State Engineer and Surveyor and the Canal Commissioners.

Meets at the Canal Department during the sitting of the Legislature ; fixes the rates of toll ; appoints the engineers, superintendents of repairs, collectors of tolls, weigh-masters, their assistants, and inspectors and measurers of lumber and timber, and of boats and their cargoes ; and directs extraordinary repairs ; hears appeals from the Canal Appraisers ; remits penalties, and regulates the police of the canals, etc.

#### CANAL DEPARTMENT.

Rooms in the State Hall, in which the business of the Commissioners of the Canal Fund and the Canal Board, and the business of the Auditor of the Canal Department, is required by law to be transacted.

G. A. Dayton, Auditor. [Invested with the powers and duties formerly belonging to the Comptroller in relation to the canals ; draws warrants on the Treasurer for all canal payments ; audits all canal accounts ; instructs canal collecting and disbursing officers ; keeps account of canal receipts and expenditures, etc. ; *ex officio* secretary of the Commissioners of the Canal Fund and of the Canal Board.]

#### CANAL APPRAISERS.

[They appraise the damage to individuals growing out of the construction of the canal. Office, State Hall, Albany.] Virus W. Smith, Thaddeus C. Davis, Charles G. Myres.

## SUPERINTENDENTS — APPOINTED JANUARY, 1874.

NAME.	Residence.	Salary.	Bonds.	In charge of.
Michael McDonough...	West Troy ....	\$1,500	\$10,000	Sec. 1, Erie canal
Benj. Van Vranken...	Schenectady..	1,500	10,000	Sec. 2, Erie canal.
C. H. Quackenbush...	Fultonville ...	1,500	10,000	Sec. 3, Erie canal.
S. B. Johnson.....	Ilion .....	1,500	10,000	Sec. 4, Erie canal.
Henry Ehle .....	Chittenango ..	1,500	10,000	Sec. 5, Erie canal.
Abram Scouten .....	Payetteville ..	1,500	10,000	Sec. 6, Erie canal.
S. B. Rowe .....	Camillus .....	1,500	10,000	Sec. 7, Erie canal.
S. D. Streeter .....	Clyde .....	1,500	10,000	Sec. 8, Erie canal.
James H. Warren .....	Clarkson .....	1,500	10,000	Sec. 9, Erie canal.
W. McKee .....	Lockport .....	1,500	10,000	Sec. 10, Erie canal.
				Sec. 11, Erie canal.
Daniel F. Wetsell.....	Stillwater .....	1,500	10,000	Sec. 1, Champlain canal.
George Connery.....	Glen's Falls...	1,500	10,000	Sec. 2, Champlain canal.
John S. Kenyon .....	Baldwinsville.	1,500	10,000	Sec. 1, Oswego canal.
				Sec. 2, Oswego canal.
James A. Flanigan ...	Seneca Falls..	1,500	10,000	Cayuga and Seneca canal.
D. P. Dey .....	Watkins .....	1,500	10,000	Chemung and Crooked Lake canal.
Harmon Bennett. ...	Binghamton ..	1,500	10,000	Chenango canal.
Dennis H. Scanlon ....	Scottsville ....	1,500	10,000	Genesee Valley canal.
Samuel F. Garman ....	Watson .....	1,500	10,000	Black River canal.

## COLLECTORS.

	Salaries.	No.	CLERKS ALLOWED AND THEIR SALARIES.				
			1	2	3	4	5
New York :							
Thomas Earll.....	\$1,440	3	\$95	\$70	\$100	....	....
Albany :							
John McKenna.....	1,080	3	95	75	55	....	....
West Troy :							
James Hammill.....	1,440	3	95	80	70	....	....
Schenectady :							
John G. Greene.....	750	2	60	50	....	....	....
Fultonville :							
Hugh Stewart .....	625	2	55	50	....	....	....
Little Falls :							
Addison H. Roof.....	625	1	55	....	....	....	....
Utica :							
Henry Ney.....	875	3	75	65	60	....	....
Rome :							
J. B. Bradt.....	875	3	70	55	50	....	....
Syracuse :							
Ezra Downer .....	960	3	70	55	50	....	....
Montezuma :							
Bertrand Ross.....	875	3	70	55	50	....	....
Palmyra :							
W. W. Myrick .....	750	2	55	50	....	....	....
Rochester :							
Nathan Thompson .....	960	3	80	70	55	....	....
Brookport :							
Edward Harrison .....	625	2	55	50	....	....	....
Albion :							
Howard Abeel.....	625	2	55	50	....	....	....
Medina :							
James Hanlon.....	625	2	55	50	....	....	....
Lockport :							
William E. Jenner .....	875	2	70	55	....	....	....
Tonawanda :							
N. S. Acker .....	960	3	70	55	75	....	....
Buffalo :							
.....	2,500	5	160	120	95	95	90
Waterford :							
Isaac Schouten.....	750	2	70	55	50	....	....
Fort Edward :							
Walter N. Lane.....	750	2	70	50	....	....	....
Whitehall :							
W. A. Wilkins .....	1,000	2	75	50	....	....	....
Salina :							
William McCann .....	750	2	70	55	....	....	....

## COLLECTORS—(Continued).

	Salaries.	No.	CLERKS ALLOWED AND THEIR SALARIES.				
			1	2	3	4	5
Phoenix:							
Oswego:	\$750	2	\$70	\$55	....	....	....
Geneva:	1,200	3	80	70	\$55	....	....
Charles Fahly	750	3	80	50	60	....	....
Watkins:	625	2	50	60	....	....	....
John I. Lane	700	....	....	....	....	....	....
Horseheads:	700	1	50	....	....	....	....
John Butcher	625	....	....	....	....	....	....
Corning:	700	1	50	....	....	....	....
Charles G. Dennison	625	....	....	....	....	....	....
Penn Yan:	625	....	....	....	....	....	....
S. C. Cleveland	625	....	....	....	....	....	....
Hamilton:	625	....	....	....	....	....	....
E. L. Mott	500	....	....	....	....	....	....
Oxford:	750	1	55	....	....	....	....
Horace S. Reid	750	1	50	....	....	....	....
Binghamton:	625	....	....	....	....	....	....
James O'Brien	625	....	....	....	....	....	....
Mount Morris:	625	1	50	....	....	....	....
F. E. Hastings	625	....	....	....	....	....	....
Caneadea:	625	....	....	....	....	....	....
John Ingersoll	625	1	50	....	....	....	....
Olean:	625	1	50	....	....	....	....
Charles W. Phillips	625	1	50	....	....	....	....
Boonville:	625	1	50	....	....	....	....
Reuben E. Nichols	....	....	....	....	....	....	....

## WEIGH-MASTERS.

Albany	John McGinnis.
West Troy	Philip W. Smith.
Utica	Jacob Selgrist.
Syracuse	Charles R. Wright.
Rochester	V. F. Whitmore.
Waterford	Henry Foley.
Oswego	

## ASSISTANT WEIGH-MASTERS.

Albany	Peter Lyon.
Albany	Martin A. Campton.
West Troy	Michael Bowles.
West Troy	John Flanigan.
Utica	James Hayes.
Utica	George Snyder.
Syracuse	John Fonda.
Syracuse	John Gebhart, Jr.
Rochester	Valentine Schwartz.
Rochester	Frank Ward.
Rochester	Joseph Fee.
Waterford	John M. Galligan.
Waterford	James H. Shine.
Oswego	
Oswego	

## INSPECTORS AND MEASURERS OF LUMBER AND TIMBER AND OF BOATS AND THEIR CARGOES.

New York	Edward Reilly.
New York	James McNally.
Albany	James Macfarlane.
Albany	George Hill.
West Troy	L. Shaughessy.
West Troy	T. Whitbeck.
Utica	M. O'Brien.
Syracuse	John Campbell.
Rochester	W. H. Tracy.
Buffalo	
Buffalo	
Oswego	
Oswego	
Whitehall	A. D. Gibbs.

## CIRCULAR TO SUPERINTENDENTS OF CANAL REPAIRS.

CANAL DEPARTMENT, ALBANY, April, 1870.

*To the Superintendents of Canal Repairs on the New York State Canals :*

It has been usual hitherto to issue circular letters from this Department explanatory of your duties, in order that you may thereby, to a certain extent at least, be informed of what will be expected of you by this Department. In preparing the following instructions, I have, to a great extent, adopted those of my predecessors, varying them where it appeared necessary to conform to changes in the laws and duties of your office.

Section 1, chapter 57, of the Laws of 1851, expressly provides that "Superintendents appointed by the Canal Board on the several canals of this State shall give their *personal* and *constant* attention to the duties of their office."

It is not competent for you, therefore, to perform your duties by proxy, or to be engaged in any other business that requires your personal attention. It is an office that requires vigilance and activity. The interests committed to your care are great, and a little negligence on your part may be the cause of great damage. You will do great injustice, therefore, to the State, and yourself also, if you assume to enter upon the duties without a firm determination to give the State your prompt, energetic and undivided attention to the duties of your office.

It is made your duty as such superintendent, under the direction of the Canal Commissioners, and particularly of the Commissioner who has charge of the line of the canal on which you are employed, to keep in good repair the canal and the public works committed to your charge; and you are, under the advice and direction of the Commissioner, to make all necessary contracts in the manner hereinafter stated for that purpose, and faithfully to expend all such moneys as shall be placed in your hands by the Canal Commissioners and the Auditor. Sections 99, 100, 101, 102 and 103, on page 236, vol. 1, of the first edition of the Revised Statutes, contain an enumeration of some of the most important of your duties, and I therefore copy them at large :

"§ 99. Each superintendent of repairs, and every collector of tolls, before he shall enter on his official duties, shall execute and file in the office of the Auditor a bond, for the faithful execution of his trust, in such penalty and form as the Canal Board shall direct, and with such sureties as the Auditor shall approve.

"§ 100. It shall be the duty of each superintendent, under the direction of the Canal Commissioners, to keep in repair such sections of the canals, and works connected therewith, as shall be committed to his charge; to make all necessary contracts for that purpose, and faithfully to expend all such moneys as shall be placed in his hands by the Canal Commissioners or the Commissioners of the Canal Fund.

"§ 101. Each superintendent shall be under the direction of the Canal Commissioners, and especially of the acting Commissioner having charge of the line of the canal on which such superintendent is employed.

"§ 102. Each superintendent shall, as often as once in sixty days, render his account to the Auditor, who shall audit the same; and if any superintendent shall omit to render his account, or his account as rendered be not satisfactory, the Auditor shall notify the Canal Board and the Commissioners of the Canal Fund thereof, and no further advances of money shall be made to such superintendent, but he shall be immediately removed from office.

"§ 103. Before any superintendent's account for expenditures shall be presented to the Auditor, the Canal Commissioner having charge of that part of the canal on

which such superintendent is employed, shall certify, on such account, that he has examined the same; that the several disbursements, specified therein were made under his direction on the canal, or for repairs necessary to be made thereon; and that he believes such disbursements to be proper and reasonable, and to have been made as charged."

You are under the necessity, from time to time, of purchasing materials and employing hands for the repair of the canal; and as it is, and always has been, the policy of the State to pay as soon as the materials are furnished or the service rendered, provision has been made to place money at the disposal of the superintendent for this purpose. The seventh and eighth sections of "An act in relation to the canals," passed May 16, 1837, provides as follows:

"§ 7. Before any advance of money shall be made to a superintendent of canal repairs, by the Auditor, he shall make out a detailed statement, in such form as the Auditor shall prescribe, of the several anticipated objects of expenditure on the line of canal under his charge.

"§ 8. If the said estimate shall be filed in the office of the Auditor, with the certificate thereon of the Canal Commissioner, stating that in his opinion the whole amount, or if less than the whole amount, what portion of the said estimate should be advanced, the Auditor may make advances on the same, in such sums and as often as he may deem necessary; provided such advances shall not exceed the amount certified by the Commissioner."

This money is to be advanced to you on satisfactory evidence that it is required for the repair of the public works. And in order that the Auditor may have a reasonable foundation for an opinion that the advance asked for by the superintendent is "required in the execution of his duties," it is necessary that you should, previous to asking for such advance, carefully examine every part of your line of the canal, and make out a full and detailed statement of all the repairs required to be made, and the sums which, in your judgment, it will be necessary to expend upon them for the ensuing sixty days. In this estimate the location and character of the work, on which the expenditure is to be made, should be given with such minuteness and precision as to enable the Commissioner to trace every dollar of the public money to some portion of the public work.

1. If a bridge is to be repaired or rebuilt, the estimate should give the expense of removing the old and preparing for the new foundation, the quantity and cost of the stone and lime, the expense of the mason work, the quantity and cost of the timber, the planks, the board, the iron work, etc. If an aqueduct, a culvert, a lock or any other structure, requires to be repaired or rebuilt, its location should be given, and a minute estimate made of the kind, quantity and cost of the different materials necessary to be used. If there are materials on hand suitable for the contemplated work, the quantity and amount paid for the materials on hand should be stated, and deducted from the estimated cost of the structure.

2. The same particulars should be given in relation to each repair which has been commenced and remains unfinished.

3. The tools, implements and apparatus to be purchased, and their probable cost.

4. The sum necessary to pay lock-tenders, according to the contracts with them for their wages, expense of lamps, etc.

5. The sum necessary to be paid, during the sixty days, to each contractor on your line.

6. If the tow-path is to be raised, or any work is to be performed which is not contracted for, the location and character of the work should be given, with a detailed estimate of the expense of doing it.

The estimated expenditure upon each bridge, culvert, etc., should be shown separately, and the total sum required for the sixty days should be given in a general footing. The regulations prescribed for the estimate under the act of 1847 are as follows:

"That every superintendent of repairs on the canal, in order to obtain an advance of moneys to be expended on the canal, shall make out a detailed statement of the several objects of expenditure for the next sixty days, so far as he can anticipate the same, stating whether for building bridges, repairing aqueducts, graveling the tow-path, the pay of lock-tenders, teams and laborers, the purchase of materials, tools and the like, and may add to the estimate a separate sum for contingencies, and shall deliver two copies of the said estimate to the Canal Commissioner.. On one of the said copies the Commissioner shall certify what amount, in his opinion, ought to be advanced, which estimate and certificate shall be filed in the Canal Department, on receiving the balance; the other copy of the estimate shall be retained by the Commissioner, to be used on the settlement of the accounts of the superintendent, at the end of sixty days."

You are required to open an account as superintendent, and separate and distinct from your individual concerns, with some bank, in which the advances made to you by the Auditor of the Canal Department are to be deposited.

You will be furnished by the bank where you keep your account with a check and bank book, the latter of which you are required to have written up at least once a month. The check book you will of course confine to your account as superintendent; and by entering in it, upon the blank margin, opposite to the check, the sums advanced to you from time to time, you will be able at any moment to tell the amount you have in bank.

The payments which you are to make upon your line of canal may be classed under five general heads, viz.:

1st. Payments to lock-tenders, which are in each case for a price certain for a month, or for two months, and the total amount of which for those periods can almost always be known with precision.

2d. Payments to regular and permanent hands under foremen who keep check rolls, and the amount necessary to pay whom for a month can, by information from the foreman a few days before the close of each month, be told with almost as much accuracy as that of the lock-tenders.

3d. Payments for materials for repairs, including payments on contract.

4th. Payments for tools, etc., being mostly merchants' and smiths' bills.

5th. Miscellaneous payments.

By a compliance with the requirements of this circular, you will always have it in your power to have to your credit, in the bank where you shall keep your account, funds sufficient for the necessary expenditures on your line of canal. And while provision is thus made for your public expenses, which will prevent the necessity of your ever having recourse to your individual credit to meet them, you will consider the funds so placed at your disposal as sacred to the uses of the canal, and that they are to be drawn from the bank no faster and in no larger sums than the necessity of payments absolutely requires. Thus, in relation to the payments of the 1st and 2d class, it is not conceived to be necessary that the moneys to make them monthly, which is as often as they will be made, need be drawn by you from the bank until near the expiration of the month in which the service shall be performed.

Payments of the third class, and their amount, cannot be anticipated with equal precision, but they can sufficiently so to render it unnecessary that you should have any considerable sum in your hands at once to meet them.

Payments of the fourth class are generally delayed by the superintendent until the close of the sixty days. Those with whom you deal to any extent, and with whom you have a running account, if they are certain of receiving their pay at the end of sixty days, would willingly delay presenting their bills until that time. Thus, payments of this class will not, generally speaking, have to be made until the close of the two months.

For payments of the fifth class, as they cannot be foreseen, and for such of those under the other heads as are of the same character, you will, of course, have to be provided with funds in your hands to the necessary amount.

The canal moneys being on interest in the deposit banks, it is expected that a superintendent will not make his drafts any oftener, nor in larger amounts, than a just regard to the public wants shall render necessary.

It is supposed, as a general rule, that not more than one-fourth of a certified advance will be wanted by a superintendent before the middle of the first month, one-fourth part at the close of the month, one-fourth part by the middle of the second month, and the residue at the close of that month. By this manner of drawing for the advance, a superintendent never need be subjected to any delay in making his payments, if his estimate be duly filed in this Department, as his deposit bank will always be willing to take his drafts on the Auditor.

The proportions of the advance, and the periods when to be drawn for, may be varied by circumstances; and should it be necessary to draw for a much larger proportion of the advance, at any one time, than as above specified, *a letter containing the reasons therefor* should be written in time to be received here previous to the presentation of the draft for payment.

By a resolution of the Canal Board, no superintendent of repairs is allowed to keep his official account at a bank which shall advance to him moneys beyond the amount for which the bank shall have advice from the Auditor that the superintendent's drafts on the Auditor will be paid.

To enable superintendents to comply with all the requirements of this circular, the Canal Board have authorized the Commissioner to allow superintendents in charge of sections not in the hands of repair contractors, such an amount of clerk hire as in his opinion shall be necessary.

This will enable you to keep the necessary accounts, and to make the prescribed estimates, reports and contracts, and the necessary copies thereof.

By keeping a separate account with every contract, with every lock-tender, and with every separate job of work, such as a bridge, a lock, a culvert, an aqueduct, in which each structure shall be charged with the quantity and cost of the stone, lime, timber, etc., excavation, embankment, mason work, carpenter work, iron, etc., etc., and also by keeping the check book or cash account, the bank book, etc., as required in the preceding part of this circular, you will be enabled at any time during the second month, by a careful examination of all these accounts, and of all the work which is going on under your supervision, to form an accurate estimate of the sum required to close up your accounts at the end of the sixty days. This examination should be made several days before the close of the second month, and in time, if it becomes necessary, to write to and get an answer from the Auditor, previous to the close of two months.

If you ascertain that you have money enough to pay all claims against you as the agent of the State, up to the time at which you are required to render your accounts, it will not be necessary for you to pursue the course hereinafter prescribed; but if, on examination, you find that the money to pay off the claims at the end of the sixty days will fall short, you should make an additional estimate and satisfy the

Commissioner of the situation of your accounts and money, and obtain from him the usual certificate for a further advance, to enable you to close up your accounts. When you ask this certificate of the Commissioner, you should exhibit to him your bank account and your expenditures, and such estimate as will enable the Commissioner to judge of the necessity of the advance.

You are not to pay out the public money without taking a receipt, dated at the time of payment; you are not, under any pretense whatever, to take a receipt without paying the money to the full amount of the receipt taken. You are not in any case to give notes or due bills to any person who has furnished materials or rendered service to the State.

A mode of transacting business, which will only be practiced by those who wish to speculate on the public money, instead of paying it to those who have earned it, must eventually result either in a fraud upon the treasury, or upon the individual who signs the receipt. To prevent either of these results, each superintendent is required to make oath that the money has actually been paid for every receipt which he asks to have credited to his account.

In the Laws of 1851, chapter 57, section 2, it is enacted that "No superintendent appointed as aforesaid shall, under any pretense whatever, take a receipt for labor done, services performed or materials furnished for the canals, when the money shall not be actually paid."

And in the first section of chapter 310 of the Laws of 1842, it is expressly required that "proof in some apt form shall be furnished on oath that it (the voucher) was so filled up at the time it was taken, and that the money, mentioned therein to have been paid, was in fact paid in cash, or by draft on some specified bank."

Every voucher taken by a disbursing officer should contain a brief and true history of the transaction between the agent of the State and the individual who signs the voucher; if it is for labor, the account should give the number of days and the date of commencing and ending; the price per day or month; and, if the voucher covers the services of any person who does not sign the receipt, the account should give such explanation as to show that the person signing the receipt had a legal right to receive and receipt for the money. For instance, if a man is employed with his son, who is a minor, or with an apprentice, the fact should be stated, and the sum for the pay of the minor or apprentice carried out in a separate line, with the price per day or month. But, in all other cases, the money should be paid to and receipted by the person who does the labor; and in no case should one man be allowed to hire hands to labor for the State, and receive the pay for such labor. All laborers should be employed by the superintendent, and the money paid to the person thus employed, or to his written order, and not to any other person.

If a disbursing officer adhere strictly to the rule of embodying in each receipt the simple truth in relation to the transaction between the State and the person signing it, he cannot be embarrassed in the settlement of his accounts. Justifiable deviations from prescribed forms may be explained or excused; but deviations from fact in a voucher destroys its validity, and an explanation, by disclosing the real facts of the case, instead of excusing the officer, tends to cast suspicion either upon his integrity or his capacity. The practice of allowing a person hired by the month to receipt for a team driven by him, but which belongs to another person, is wrong, although the interests of the State may not be affected, for the simple reason that the voucher does not give a true relation of the transaction. Such a voucher, however, may be rendered valid by a writing from the owner of the team, authorizing the driver to receipt for the use of it.

To every voucher of merchants, mechanics and miscellaneous accounts, in which



are included articles purchased or services rendered, not paid for on delivery of articles or at time of rendition of service (and which is intended especially to include running accounts of every description), all accounts for labor not included in check rolls, all bills left unpaid by your predecessor, which you may be authorized or directed to pay, must be verified, before payment, before yourself or some officer authorized to administer oaths, which affidavit must be attached to the voucher and returned therewith to this Department. The following form of affidavit has been prepared for such purpose. As it is desirable that at the expiration of each sixty days the Department should be furnished with the full amount of expenditures during such period, there will be required in cases of all vouchers, including any item or charge accruing at a date anterior to the last abstract of expenditure, to be added to the affidavit a statement or explanation of the reasons why the same was not previously presented or paid :

STATE OF NEW YORK, }  
COUNTY OF , } ss. :

A. B. (or if a firm, say A. B., one of the firm of C. D. & Co., named in the annexed account), of , in the county of , being duly sworn, saith that all the items in the annexed account are correct, and accrued at the dates respectively as stated therein; that no part of the same or any item therein is charged at more than its fair value; that it is a just claim against the State of New York to the amount of dollars and cents, specified therein; that no part thereof hath been included in any former bill rendered against the State; that there are no legal or equitable offsets against the same; that the same, or any part thereof, hath not been paid to this deponent or any other person, by or in behalf of said State, to the knowledge, information or belief of this deponent; that this deponent is (or if a firm, say that the said firm are) the lawful owner of such account, and entitled to the payment thereof. And, further, that all the labor charged therein has been applied upon the works and to the benefit of the State; and that all the property charged therein has been delivered to the duly authorized agents of the State, and, according to the best of the knowledge, information and belief of this deponent, used for the benefit of the State, by or under the direction of one of the authorized agents thereof.

#### FOREMEN AND ROLLS.

Industrious and faithful men ought to be employed as foremen, on whose fidelity reliance can be placed to keep the roll with such accuracy as to do justice to the individual as well as to the State. The roll should be made up at the end of every month, and the number of days for which each person has labored should be carried out opposite his name, with the price per day or month, and the total sum due him; and the roll, thus made out, should be read in the hearing of each laborer, or at least the foreman should state to each laborer the number of days, the price and the total sum entered on the roll opposite his name. When the roll is thus made out, and the sums footed up, the truth of it is to be verified by the oath of the foreman, in the following form :

STATE OF NEW YORK, }  
COUNTY OF , } ss. :

of , a foreman under , superintendent, being duly sworn, saith that the foregoing check roll, the total number of days' labor entered on which is , was kept by him as foreman of the laborer and teams entered thereon; and that he has himself (and has good reason to believe that the

several other persons and the teams entered upon said roll have) performed the labor in the service of the State for the whole number of days and parts of days stated in said roll, and at the prices entered opposite each name and team respectively ; and that the description of each work, and the number of days on each work, as entered on said check roll, is in all respects just and true, according to the best of his knowledge and belief.

A. B., *Foreman.*

Subscribed and sworn to, this  
day of 187 , before me, }

C. D., *Superintendent of Canal Repairs.*

If the labor has not in all cases been performed under the inspection of the foreman, so as to enable him to swear positively that it has been done, he can make such exceptions as the case requires.

It is desirable that the oath be administered in all cases by the superintendent. If the superintendent is not present, the roll may be sworn to before any judge, justice or commissioner.

The roll being thus verified, you should yourself pay to each individual the sum due him according to the roll, and take his receipt therefor, which should be dated on the day of the transaction.

The receipts should be numbered, commencing with the first name on the roll for No. 1, and numbering them in the order in which the names stand on the roll. These receipts, without being folded, should be arranged according to their numbers, and carefully folded in the check roll, which should be filed on the outside of the roll, with the name of the foreman, the month embraced in the roll, and the total amount paid on it.

This roll, covering the receipts of all the laborers under one foreman for a month, will occupy only one line, or the space of a single voucher, on the abstract of the superintendent, and will be numbered on the outside, with reference to the other vouchers entered upon the general abstract. The entries upon the check roll should be confined exclusively to the labor of the hands employed by the State, and the service of teams where they are furnished. The foreman and hands employed by the month are not allowed to furnish materials, and therefore the roll will be confined to their labor ; and, if the same individual who is temporarily employed with his team, has also an account for materials furnished, the receipt for materials should be entered separately on the abstract of the superintendent.

Your accounts being prepared as above directed, and having made yourself sure that you have made all the payments and procured all the vouchers for the two months, you are to enter at the bottom of the abstract the one-sixth part of your salary, which you are to retain at the closing of each account. In this shape you are to lay the accounts before the Canal Commissioner upon your line, and his signature to the certificate, required from him, must be obtained before the accounts can be allowed, or even examined at this office. This should be done as soon after the close of each two months as is possible ; and that you may be prepared to lay the accounts before the Commissioner, without delay to him, you should have the vouchers taken, and in order, and the abstract completed immediately after the expiration of the last month.

When all the vouchers and the amount of your salary for two months have been entered upon the abstract, and the general statement of your account is made, according to the form on the abstract annexed, the whole is to be verified by your oath, in the following form :

STATE OF NEW YORK, }  
COUNTY OF , 18 . } ss.:

, superintendent of canal repairs, having charge of the line of canal specified in the above abstract, doth solemnly swear that the foregoing is a true abstract of all the vouchers taken by him as such superintendent for the days ending on the day of , 187 ; and doth further swear that the money specified in the several receipts, of which the above is an abstract (except vouchers marked A, paid by agent), has been actually paid, as specified in said receipts, in cash or by check on the bank ; and, further, that all the receipts, not specially excepted, were each and every of them filled up as they now appear before they were signed ; and he doth further swear that, according to the best of his knowledge and belief, all the labor has been performed, services rendered and materials furnished for the benefit of the State, and the State alone, and at as fair and reasonable prices as the same could be procured ; and further swears that all fines, penalties and forfeitures collected, and the sales of public property made during the period aforesaid on the line of canal under his charge, are, according to the best of his knowledge and belief, correctly entered on the said abstract.

Subscribed and sworn to before me }  
this day of , 18 . }  
 , Commissioner.

[In the absence of the Commissioner, the oath may be taken before any judge, justice or Commissioner.]

If, from sickness, or any other cause, you are unable to go through your line and make the payments yourself, as you ought to do when you are able, you must then make such exceptions in the oath as the case requires, making a note on the back of each receipt, stating by whom the money was paid, and furnish an affidavit, to supply the deficiency, from the agent whom you shall have employed to go through the line for you and make the payments. Those who keep the rolls should not be furnished with money to pay the hands on their rolls. There have been abuses under this practice which make it necessary to discontinue it, except in special cases ; and then an explanation of the circumstances should be given to justify a deviation from the rule.

#### REPORT AT THE END OF SIXTY DAYS.

At the close of the sixty days, in addition to the rolls of your foreman, and the receipts and abstract, you should prepare a full report, in the same order in which the estimate was made, showing the expenditure upon each structure, repair or job, and the separate cost of the labor and the different kinds of materials used, and the cost of all the materials furnished and work done on the line for the sixty days. If the cost of any culvert, bridge or other expenditure differs materially from the original estimate, the cause of such difference should be explained. Such report of expenditure should include all your expenditures during such sixty days ; and no bills or accounts should be left unpaid to be included in any subsequent report.

#### PURCHASES, BY WHOM MADE.

There has been a practice tolerated by some of the superintendents of allowing foremen, lock-tenders and others to make purchases on the credit of the State. All purchases should be made by the superintendent personally, or on his *written order*, and not otherwise. The superintendent is furnished with money to pay for everything which is required for the repair of the canals, and as soon as any work

for the State is done, it should be promptly paid for; and, at all events, the persons employed by the superintendents should not, in any case, be allowed to purchase articles for the canal on the credit of the State.

#### APPOINTMENTS OF SUBORDINATES.

Chapter 57 of the Laws of 1851, section 3, confers upon you the power to appoint subordinates, and I therefore insert herein such section at large :

" Each superintendent so appointed shall have power to appoint his own foreman, lock-tenders and other subordinate persons necessary to enable him to discharge his official duties, and the compensation to each shall not exceed the rate of compensation established by the Board of Canal Commissioners; but the Canal Commissioner in charge of any section of the canal in which any foreman, lock-tender or other subordinate person may be employed, or the Board of Canal Commissioners, shall have absolute power to remove any foreman, lock-tender or other subordinate for misconduct, incompetency or neglect of duty, provided such Canal Commissioner or the Board of Canal Commissioners making such removal shall specify the cause of such removal in writing and file the same in the office of the Auditor of the Canal Department within ten days from the date of such removal. In case of the removal of any such foreman, lock-tender or other subordinate, it shall be the duty of the Commissioner or the Board of Canal Commissioners making such removal immediately to notify the superintendent in charge of the section of the canal where such removal shall be made of the fact of such removal; and in case the superintendent shall neglect or refuse, for three days, to fill the vacancy thus created, and to notify the Commissioner or Board of Canal Commissioners thereof, it shall be the duty of the Canal Commissioner or the Board of Canal Commissioners making such removal to fill such vacancy."

#### LOCK-TENDERS.

In the employment of lock-tenders, you should employ such men only as will give their personal attention to the business, and under no pretense should a contract for tending locks be made with a person who intends to sub-let or farm it out; and if any person, after his appointment as a lock-tender does not give it his personal attention, or sub-lets or farms it out in any manner, you are required forthwith to remove him, and appoint another who will properly attend to his duties.

The lock-tender has the power of determining as to the preference between boats in passing a lock; and he ought not only to be in attendance himself, but he should be a sober, honest and discreet man, who can be relied upon to decide these questions promptly and impartially.

Lock-tenders are prohibited by a resolution of the Canal Board from being concerned in any grocery on or near the canal. You are particularly required to see that this resolution is strictly complied with.

It is alleged that some of the lock-tenders on the canal have been in the habit of receiving presents of wood, etc., from boatmen; and it is inferred that those who receive such favors repay them by giving to such persons an undue preference at the lock. The lock-tender should in no case place himself in a position which will expose him to the suspicion, on the part of a boatman against whom he may decide, that his position is influenced by any benefits conferred by the person in whose favor he may decide. The practice alluded to is as objectionable as it would be for a magistrate, on the trial of a suit between two neighbors, to receive a present from either of the parties; a right decision, under such circumstances, would not protect

the magistrate from the suspicion that his mind was biased by the favor conferred ; at least this would be the opinion of the defeated party, under a feeling that his cause was a just one.

Every suit commenced by a lock-tender should be immediately reported to the superintendent ; and all fines collected should be accounted for at the close of each month, and the particulars of each case should be entered in the books of the superintendent, and the moneys received should be accounted for in his first settlement after the transaction.

If any suit is to be carried to a higher court, the particulars of the case should be reported to the Auditor in the same manner as is required in relation to suits commenced by the superintendent himself.

As soon as the lock-tenders are appointed on your line, you are requested to send a list of their names to the Auditor, the number of the lock or locks in charge of each, the pay per month or the amount of the contract with each person. This will enable the Auditor to estimate how much you require per month for lock-tending, and when you require it, as payment can only be necessary monthly.

#### CONTRACTS.

All contracts for materials or jobs made by you should be in writing, and duly executed by the parties, and an account opened in each case on the books of the superintendent ; no contract should be made or important improvement undertaken by you without the express approval and ratification of the Commissioner, and such approval or ratification of a contract should be signified by a certificate or indorsement on the contract. As soon as the contract is executed, notice should be given to the Auditor, stating the substance of the contract, the name of the contractor, and such particulars as will enable the Auditor to form an estimate of the amount of money required to complete the payments on the contract ; the contract itself should be sent to the Auditor, with the voucher for the first payment under it. If other payments are to be made on the same contract, the superintendent can retain a copy of it for his use. The return alluded to will aid the Auditor in determining, when an advance is asked for, whether it is required to meet engagements made on behalf of the State.

You are prohibited by a resolution of the Canal Board from participating in any contract on the canals. This prohibition extends to all materials, tools or implements for the use of the canals, or any transaction by which you shall, directly or indirectly, be benefited by any of the money disbursed by you as superintendent. You cannot properly allow any contractor to take timber or materials from your land and receive a compensation therefor ; and you should not do indirectly, through any relatives or friends, what you are not allowed to do directly by the law, the regulations and your instructions.

So far as you have it in your power, you should extend the same prohibition to your foremen, lock-tenders, and all other persons employed by you on the State work. You should make no contracts with those who are employed in the service of the State, by the month, or any fixed period, for the supply of materials in repairing the canal. Any bargain of this kind, on the part of a lock-tender or a foreman, is entirely inconsistent with his previous contract, to give the State his whole service as such foreman, lock-tender or laborer.

The fact has been disclosed, on the trial of one superintendent, that persons who were paid almost constantly for serving the State, were at the same time used as the instruments in buying off bidders for a contract, and getting possession of a job under a higher bid ; thus depredating upon the State instead of serving it faithfully

as they were bound to do, while they were retained from month to month, if not from year to year, in its service.

All contracts for repairs or improvements, directed by the Legislature or the Canal Board, must be made in writing, and public notice must be given that sealed proposals will be received for entering into such contracts. The ordinary repairs of a canal may be made without a special contract. But in all cases where the execution of a job, not directed by the Legislature or the Canal Board, can as conveniently be done by contract as those improvements which are thus directed, the State should have the benefit of the competition provided for in the law.

It is considered that all work which is susceptible of measurement should be done by written contracts at specified prices. Sufficient public notice should be given for sealed proposals for all contracts, and in such manner as the Commissioner may from time to time direct.

#### ANNUAL REPORT OF PROPERTY IN CHARGE OF SUPERINTENDENTS.

You are required to make an annual report, giving a schedule of all the property belonging to the State on the line of canal under your charge. This will require you to keep a memorandum of every article purchased for the use of the State, and of all tools or implements which are worn out, broken or lost, in order that you may, on the first day of January, in each year, render a satisfactory account of the property on hand, compared with the previous schedule, and the purchases between the periods of making the two reports.

#### OLD MATERIALS, HOW DISPOSED OF AND ACCOUNTED FOR.

Whenever aqueducts or other structures are repaired, the utmost caution and strictness should be observed in relation to the old materials. These materials, of every description, if not necessary to be preserved for the use of the State, should be sold to the highest bidder, after giving reasonable public notice of the sale. The proceeds of such sale should be reported and accounted for at the close of the sixty days in which the sale is made. And you should, in thus reporting it, specify the time and place when such sale was made, and the notice that was given thereof. The superintendent should not himself be interested in any purchases of public property sold on the line of the canal.

Whenever paddle-gates, or any of the iron work connected with the locks, are replaced, the lock-tender should be held responsible for the safe keeping of the old article, which, if it cannot be repaired and used, should be disposed of by the superintendent for the benefit of the State, and accounted for by him.

#### SUITS FOR PENALTIES, ETC.

The superintendents, in a great variety of cases, are authorized to sue, in the name of the people, for penalties for violations of the canal law and the regulations of the Canal Board. Where the superintendent is sued, or commences a suit before a justice, if the suit is to be carried to a higher court by either party, a full statement of the case should be made and sent to the Auditor, in order that the advice of the Attorney-General may be obtained before a heavy bill of costs has been made for the State to pay. Claims for costs, unless a sum sufficient for the purpose is recovered, cannot be paid until they are examined and allowed by the Commissioners of the Canal Fund, as required by law.

## BREACHES.

Whenever there is a breach in the canal, you should immediately give notice of it to the Auditor as well as the Commissioner. If money will be required to enable you to pay off the hands employed on the breach, you should state the facts in your notice to the Auditor. As soon as the breach is repaired, the Auditor should be informed of it, and of the expense incurred. This is desirable, as well on account of having authentic information in relation to the condition of the navigation as on account of the expenditure for the repair.

Timely examinations of the structures connected with the public works, and unremitting vigilance on the part of the superintendent and those employed under him, may, in almost every case, prevent breaches. Where they take place, and a heavy expense is incurred by the State, and the trade of the canals is interrupted, it is important that the superintendent and those under him should be enabled to show that the occurrence is not attributable to any neglect on their part.

Last season was one peculiarly unfortunate in regard to breaches, and it is believed that the most part, if not all of them, could have been avoided by proper care and attention on the part of the superintendents and their subordinates. With proper watching and regulation of the levels, breaches in the canal seldom, if ever, need occur; and you will be expected to use every means within your power to protect against them. The Canal Board, believing that they are generally more the result of negligence than unavoidable accident, have directed me to notify you that they will hold each superintendent to a rigid accountability for any breaches that may occur upon his section; and will act upon the principle that a superintendent who cannot, except under very extraordinary circumstances, protect the canal from breaches, is *incompetent* for the charge.

## PUBLICATION OF MONTHLY ABSTRACT.

The law passed in March, 1853, being chapter 52 of the Laws of that year, which requires you to publish monthly abstracts of your disbursements, provides that "the expense of such publication shall not exceed the sum of fifteen dollars, to be regulated and fixed by the Auditor of the Canal Department." Taking the experience of former publications, I have concluded to fix the rate of compensation, applicable to all papers, at seventy-five cents *for each sixteen lines of an ordinary newspaper column*, which, for the Evening Journal and Argus, of this city, is called a square. Experience thus far shows that, at that rate of compensation, the expense of three-fourths of the publications would not average more than about nine dollars per month, while the average of the largest would scarcely exceed fifteen dollars per month.

It must, of course, be understood that you cannot pay more than fifteen dollars for a single month. If, at the rate fixed, it would amount to more than fifteen dollars, and no paper will publish it, then you are to file it as directed by the law.

Almost all the papers follow the form prescribed, and confine the publication to the width of a column. A few occupy the width of two columns. In such cases the pay will be for only one-half the space occupied, and at the rate mentioned.

## NOT TO RETAIN MONEY BELONGING TO WORKMEN.

You should not retain in your hands the money belonging to the workmen, or any of them, although they may request you to do it for their use and benefit. If any of them desire to deposit their money with you for safe keeping, you should decline receiving it; being the agent of the State, you cannot accept these trusts from those who work for the State without creating in their minds the belief that

in this transaction, also, you are, in some degree, acting in your official capacity, and that the State ought to be responsible for your acts.

You have a high responsibility cast upon you, and the interests of the State, as well as the interests of those who navigate the canals, are to be affected, favorably or unfavorably, by the manner in which you discharge your duties. You cannot do justice to the public, or to your own character, without being constantly on the line of the canal and devoting your whole energies to the public service.

Money is placed in your hands, to an immense amount, with the confident reliance that you will faithfully expend it in paying those who have furnished materials for the canal or rendered service to the State. Beyond the amount of your own salary, which you are allowed to receive every two months, you should not permit yourself to use a dollar of the public money for private purposes, under any pretense whatever.

#### CLERKS, ETC.

Such superintendents as are allowed clerks will appoint such clerks subject to removal by the Canal Commissioner, who will also determine the amount to be paid them for their services.

You will receive from your predecessor, the late superintendent of repairs, all books, blanks, papers and other property belonging to the State, which he may have in possession, rendering a receipt therefor, and send a copy of such receipt to this office.

#### PATROLMEN.

Act chapter 55 of the Laws of 1870 authorizes the Canal Board to appoint as many patrolmen as it may deem necessary to act as a police along the canal and enforce the canal laws and regulations. Section six of said act further provides that "such patrolmen shall be assigned to such portions of the canals as the Commissioner shall direct, and shall be subject to and under the control of said Commissioner, *and the officer in charge of the repairs of such portion of the canal.*"

The regulations in regard to patrolmen, adopted by the Canal Board June 16, 1870, provide, among other things, that "it shall be the duty of such patrolmen to pass over that portion of the canal assigned them daily, and oftener, if necessary, to see that the levels are kept at a proper and uniform height; that water is not unnecessarily wasted, or wrongfully taken from the canal; that timely warning is given to the repair agents of leaks or other dangers to the canal; that the locks are well and properly attended; that boats are not overloaded; that boatmen keep their boats moving, and in such shape at all times as not to in any way or manner obstruct the flow of water or navigation."

You are, therefore, required to exercise such supervision and "control" over the patrolmen that have been or may be regularly appointed and stationed upon your section of the canal, as will secure from them the faithful performance of their duty, and enable you to render to the Commissioner in charge a truthful account of the number of days each patrolman has served the State during the preceding month.

You will carefully preserve all circulars, pamphlets and printed directions which you may, from time to time, receive from this office, and carefully place the same in file.

Yours, respectfully,

JAMES A. BELL,  
*Auditor.*



*AN ABSTRACT of expenditures by A. B., superintendent of repairs upon the canal, and having charge for the sixty days commencing on the 1st of April of miles of said canal, extending from and ending on the 31st of May, 1870.*

[illegible]

## FORM—(Continued).

Balance from last abstract due the State (or due me, as the case may be),	\$40 00
Deposited since that abstract my drafts on the Auditor of the Canal	
Department to my credit in the bank....	2,920 00
	<hr/>
	\$2,960 00
Expended as per abstract .....	2,624 93
	<hr/>
Balance .....	\$335 07
	<hr/>
Of this balance there is in bank .....	\$300 00
Of this balance there is in hand .....	35 07
	<hr/>
Total in bank and in hand, equal to balance above...	\$335 07
	<hr/>

A. B., *Superintendent of Canal Repairs.*

Dated this 2d day of June, 1870.

STATE OF NEW YORK, }  
COUNTY OF , } ss.:

, superintendent of canal repairs, having charge of the line of canal specified in the above abstract, doth solemnly swear that the foregoing is a true abstract of all the vouchers, taken by him as such superintendent, for the days ending on the day of , 187 ; and doth further swear that the money specified in the several receipts, of which the above is an abstract (except those marked "A" on the back as having been paid by agents), has been actually paid as specified in said receipts, in cash or by check on the bank ; and, further, that all the receipts, not specially excepted, were each and every of them filled up as they now appear before they were signed ; and he doth further swear that, according to the best of his knowledge and belief, all the labor has been performed, services rendered and materials furnished for the benefit of the State, and the State alone, and at as fair and reasonable prices as the same could be procured ; and further swears that all fines, penalties and forfeitures collected, and the sales of public property made during the period aforesaid, on the line of canal under his charge, are, according to the best of his knowledge and belief, correctly entered on the said abstract.

A. B., *Superintendent.*

Subscribed and sworn to before me this }  
day of , 187 . }  
C. D., *Canal Commissioner.*

[In the absence of the Canal Commissioner, the oath may be taken before any judge or commissioner.]

I certify that I have examined the preceding abstract, and the vouchers of which it is an abstract, amounting to dollars and cents ; that the several disbursements specified therein, were made under my direction on the canal or for repairs necessary to be made thereon, and that I believe such disbursements were proper and reasonable, and have been made as charged in the said abstract and vouchers.

(Signed.)

C. D., *Canal Commissioner upon that part of the canal described in the heading of the above abstract.*

Dated 6th day of June, 1870.

## NOTES.

Vouchers and check rolls should be entered invariably in the order of the dates. Both sides of their sheet are to be written upon. No. 7 is to be equal to the footings of all the columns from No. 2 to No. 6, inclusive.

Should a voucher contain articles or matter that would come under two or more of the above heads, put the true amount under each head, and the total in the total column.

The column before the one headed "lock tenders" is intended for the entry of lock tending and check rolls for a month, to get at the footing of each for that period, to be carried under the appropriate heads.

The above "form" is intended to show the superintendents how they are to fill up their abstracts to be sent to the Canal Department. It is expected that this "form" will be always used by every superintendent as a guide in making up their abstracts.

STATE OF NEW YORK, CANAL DEPARTMENT, }  
ALBANY, , 187 . }

To.....

SIR.—At a meeting of the Canal Board, held , 187 , you were appointed a patrolman, under act, chapter 55 of the Laws of 1870, to be assigned to duty on such portion of the canals as the Commissioner in charge of the Division may direct, at a salary of dollars per month.

Within ten days after the receipt of this notice, you are required to take and subscribe the official oath required by the Constitution of this State, file the same in the office of the clerk of the county in which you reside, and transmit a certified copy thereof to this Department.

On the opposite side of this sheet you will find a certified copy of the regulations adopted by the Canal Board, June 16, 1870, in regard to the duties of patrolmen. I will also send you a certified copy of the canal laws and regulations.

Yours, etc.,

....., Auditor

## REGULATIONS IN REGARD TO PATROLMEN.

The Commissioner in charge shall assign to each of the patrolmen appointed by the Canal Board such beat or portion of the canal on his division as he shall deem expedient. Such patrolman shall take the oath of office prescribed by the Constitution of the State, within ten days after notice of appointment, and file the same in the office of the county clerk of the county in which he shall reside, and also in the office of the Auditor at Albany.

It shall be the duty of such patrolmen to pass over that portion of the canal assigned them daily, and oftener if necessary, to see that the levels are kept at a proper and uniform height; that water is not unnecessarily wasted or wrongfully taken from the canal; that timely warning is given to the repair agents of leaks or other dangers to the canal; that the locks are well and properly attended, that boats are not overloaded; that boatmen keep their boats moving, and in such shape at all times as not to in any way or manner obstruct the flow of water or navigation.

Every master or person in charge of a boat or float shall obey the orders of the patrolmen as to taking off a part of their cargo, if overloaded; as to keeping their boats or floats in such shape, at all times, as not to obstruct navigation or the flow of

water, and shall move their boats or floats, or moor them, as he shall direct, in order to facilitate navigation and promote the best interest of the State and navigator; but for any willful neglect of these things, or disobedience of the orders of patrolmen with reference thereto, such master or person in charge of a boat or float shall be liable to a fine of from five to ten dollars for each offense, dependent upon the nature of the same, which fine may be laid and collected by such patrolman, and the boat or float detained until such fine be paid. All fines so collected to be paid to the State.

Each patrolman, by virtue of act, chapter 55, of the Laws of 1870, has police powers and authority to arrest and detain offenders for any violation of the rules and regulations of the Canal Board, made and adopted pursuant to law, until the persons or parties so offending shall satisfy the demands of the same.

STATE OF NEW YORK, CANAL DEPARTMENT.

I certify, that I have compared the foregoing regulations with the original regulations, adopted by the Canal Board on the 16th day of June, 1870, and that the same is a true copy thereof, and of the whole of said original regulations.

In witness whereof I have hereunto set my hand and affixed my official seal, this 16th day of June, A. D., 1870.

....., *Auditor.*

..... 1870.

I hereby certify that , a patrolman, stationed at , on section of canal, has faithfully performed the duties prescribed by the regulations in regard to patrolmen, adopted by the Canal Board June 16, 1870; and rendered such other services on the canal as have been required of him and that he is justly entitled to pay for days' service in the month of , 1870.

..... *Superintendent,*  
Section of canal.

*STATEMENT of the number of locks, their lift in feet, total lockage of each canal, etc., etc., of all the canals in the State of New York.*

NAME OF CANAL.	Length in miles.	Lockage in feet.
Erie canal .....	351.78	654 80
Navigable feeders of same .....	8.85	.....
Champlain canal .....	66.00	179.50
Pond above Troy dam .....	3.00	.....
Glen's Falls feeder and pond .....	12.00	132.00
Black River canal .....	35.33	1,082.25
Black River feeder .....	13.47	.....
Black River improvement .....	42.50	.....
Oneida Lake canal .....	6.00	62.00
Oswego canal .....	38.00	154.85
Oneida River improvement .....	20.00	7.85
Seneca River towing-path .....	5.00	.....
Baldwinsville canal .....	1.00	8.00
Cayuga and Seneca canal .....	22.77	76.61
Crooked Lake canal .....	8.00	277.83
Chemung canal and feeder .....	39.00	504.88
Cayuga Inlet .....	2.00	.....
Chenango canal .....	97.00	1,015.33
Genesee Valley canal and feeder .....	116.50	1,045.39
Danville branch of same .....	11.00	82.50
Total .....	889.70	5,283.79

NAME OF CANAL.	Length in miles.	SIZE OF CANAL.			NUMBER AND SIZE OF LOCKS.			Average burthen of boats.	Maximum burthen of boats.
		Width on surface.	Width on bottom.	Depth of water.	Number of locks.	Length between quoins.	Width in clear.		
Erie canal .....	363	40	28	4	83	90	15	70	76
Enlargement of same .....	350 $\frac{1}{2}$	70	56	7	71	110	18	210	240
Oswego canal .....	38	40	24	4	18	90	15	70	76
Enlargement of same .....	38	70	56	7	18	110	18	210	240
Cayuga and Seneca canal .....	21	40	24	4	10	90	16	70	76
Enlargement of same .....	23	70	56	7	11	110	18	210	240
Champlain canal .....	66	50	35	5	20	110	18	85	120
Glen's Falls feeder .....	12	50	35	5	12	100	18	80	85
Pond above Troy dam .....	3	.....	.....	.....	1	.....	.....	.....	.....
Black River canal and feeder .....	50	42	26	4	109	90	15	70	76
Black River improvement .....	42	.....	.....	.....	1	110	18	70	76
Genesee Valley canal .....	124 $\frac{1}{2}$	42	26	4	112	90	15	70	76
Chenango canal .....	97	40	24	4	116	90	15	71	76
Chemung canal and feeder .....	39	42	26	4 $\frac{1}{2}$	53	90	15	85	90
Oneida River improvement .....	20	80	60	4 $\frac{1}{2}$	2	120	30	70	76
Oneida Lake canal .....	7	70	56	7	7	110	18	220	220
Baldwinsville and Seneca towing-path .....	5 $\frac{1}{2}$	40	24	4	1	90	15	70	76
Crooked Lake canal .....	8	42	26	4	27	90	15	70	76

## ERIE CANAL.

Total cost of construction, \$43,639,324.

REMARKS.	Old canal (not now in existence).	Enlargement.
Construction authorized .....	April 15, 1817 .....	May 11, 1835.
Construction commenced .....	July 4, 1817 .....	August, 1836.
Construction completed .....	Oct'r 26, 1836 .....	September, 1862.
Estimated cost at engineer's prices..	\$4,926,738 .....	\$23,402,863.
Actual cost of construction .....	\$7,143,789 .....	\$36,495,535.
Total feet of lockage .....	675½ feet .....	654 80-100 feet.
Length from Albany to Buffalo .....	363 miles .....	350½ miles.
Number locks and size of chambers,	83 locks, 90 x 115 .....	72 locks, 110 x 18.
Size of prism .....	40 and 28 x 4 .....	70 and 56 x 7.
Maximum dimension of boats .....	78 62-100 x 14 46-100 x 3½ draft, 1..	98 x 17 5-11 x 6 5-12 draft, 2.
Burthen of boats .....	75 tons .....	220 tons.

## LOCKS.

No. of lock.	Double or single.	Lift.	No. of lock.	Double or single.	Lift.	No. of lock.	Double or single.	Lift.
1	Double .....	15½	25	Double .....	8	49	Double .....	6
2	Single .....	9½	26	" .....	8	50	" .....	6 11-12
3	Double .....	11½	27	" .....	8	51	" .....	5½
4	" .....	11½	28	" .....	8	52	" .....	11
5	" .....	10	29	" .....	7	53	Single .....	6
6	" .....	10	30	" .....	10½	54	" .....	7½
7	" .....	10	31	" .....	6	55	" .....	6
8	" .....	10	32	" .....	8	56	" .....	10
9	" .....	10	33	" .....	6	57	" .....	8
10	" .....	10	34	" .....	8	58	" .....	8
11	" .....	10	35	" .....	8	59	" .....	8
12	" .....	10	36	" .....	10	60	" .....	10
13	" .....	10	37	" .....	10	61	Double .....	9
14	" .....	10	38	" .....	9½	62	Single .....	9
15	" .....	10	39	" .....	10½	63	" .....	9
16	" .....	10	40	" .....	10½	64	" .....	10
17	" .....	10	41	" .....	8	65	" .....	10
18	" .....	10½	42	" .....	8	66	" .....	9
19	" .....	8½	43	" .....	8	67	} Combined. 2 Gd. Bk. Rk. & Buf.	55 10-12
20	" .....	10	44	" .....	10½	68		
21	" .....	11½	45	" .....	10½	69		
22	" .....	11½	46	" .....	3	70		
23	" .....	8	47	" .....	10½	71	Double .....	2
24	" .....	8	48	" .....	10½		Single .....	

## LOCATION OF LOCKS.

COUNTIES.	Nos. of locks.	COUNTIES.	Nos. of locks.
Albany .....	1 to 18, inclusive.	Onondaga .....	47 to 50, inclusive.
Saratoga .....	19 and 20.	Cayuga .....	51 and 52.
Schenectady .....	21 to 25, inclusive.	Wayne .....	53 to 60, inclusive.
Montgomery .....	26 to 34, inclusive.	Monroe .....	61 to 66, inclusive.
Herkimer .....	35 to 45, inclusive.	Orleans .....	
Oneida .....	46	Niagara .....	67 to 71, inclusive.
Madison .....			

## CHAMPLAIN CANAL AND GLEN'S FALLS FEEDER.

Construction authorized.....	April 15, 1817.
Glen's Falls feeder authorized.....	April, 1822.
Estimated cost of canal at engineer's prices.....	\$371,000.
Navigation opened from Fort Edward to Lake Champlain.....	November 24, 1819.
Canal completed from Waterford to Lake Champlain.....	1822.
Canal cost of construction up to 1832.....	\$921,011.
Feeder, cost of construction up to 1837.....	\$91,944.
Total cost of both included improvements, exclusive of ordinary repairs, June, 1868.....	\$2,378,910.
Number of locks on canal, 20; feeder, 13.....	Size, 110 x 18 and 100 x 15.
Length of canal, 66 miles; feeder, 7 miles; pond, 5 miles.....	73 miles.
Size of prism, canal and feeder.....	40 26 x 4.
Size authorized, chap. 213, Laws 1860.....	50 35 x 5.

## LOCKS.

CHAMPLAIN CANAL.						GLEN'S FALLS FEEDER.			
No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.
1.....	10½	8.....	8½	15.....	8	1.....	10	8.....	10
2.....	10½	9.....	10	16.....	7	2.....	10	9.....	10
3.....	8½	10.....	9½	17.....	8½	3.....	10	10.....	10
4.....	9	11.....	11½	18.....	9	4.....	10	11.....	11
5.....	9	12.....	9	19.....	9	5.....	10	12.....	11
6.....	9	13.....	10½	20.....	10	6.....	10	13.....	10
7.....	9½	14.....	8			7.....	10		

## BLACK RIVER CANAL, FEEDER AND BLACK RIVER IMPROVEMENT.

Construction authorized.....	April 19, 1836.
Construction commenced.....	January, 1838.
Estimated cost at engineer's prices.....	\$1,068,437.
Estimated cost at contract prices.....	\$2,431,669.
Canal completed.....	1849.
Cost of construction.....	\$3,224,779.
Number and size of locks.....	109 locks, 90 x 15.
Length of canal to Lyon's Falls.....	35 miles.
Length of river to Carthage, and fall.....	42 miles; 9½ feet.
Size of prism of canal and feeder.....	42 and 28 x 4.
Length of navigable feeder, and fall.....	10½ miles; 6 10-100 feet.
Burthen of boats.....	45 to 50 tons.
Lockage of canal.....	1,082½ feet.

## LOCKS.

No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.
1.....	10	23.....	10	45.....	10	67.....	10	89.....	10
2.....	10	24.....	10	46.....	10	68.....	9	90.....	10
3.....	10	25.....	10	47.....	10	69.....	9	91.....	12
4.....	10	26.....	10	48.....	10	70.....	9	92.....	10
5.....	10	27.....	10	49.....	10	71.....	10	93.....	10
6.....	10	28.....	10	50.....	10	72.....	10	94.....	10
7.....	10	29.....	10	51.....	10	73.....	10	95.....	10
8.....	11	30.....	10	52.....	10	74.....	10	96.....	10
9.....	12	31.....	10	53.....	10	75.....	10	97.....	10
10.....	11	32.....	10	54.....	10	76.....	10	98.....	10
11.....	11	33.....	10	55.....	10	77.....	10	99.....	10
12.....	11	34.....	10	56.....	10	78.....	10	100.....	10
13.....	8	35.....	10	57.....	10	79.....	10	101.....	10½
14.....	8	36.....	10	58.....	10	80.....	9	102.....	10½
15.....	8	37.....	10	59.....	10	81.....	9	103.....	4
16.....	10	38.....	10	60.....	10	82.....	9	104.....	10
17.....	8	39.....	10	61.....	10	83.....	9	105.....	10
18.....	10	40.....	10	62.....	10	84.....	9	106.....	11
19.....	8	41.....	10	63.....	10	85.....	10	107.....	11
20.....	10	42.....	10	64.....	10	86.....	11½	108.....	12
21.....	10	43.....	10	65.....	10	87.....	10	109.....	12
22.....	10	44.....	10	66.....	10	88.....	10		

## ONEIDA LAKE CANAL AND ONEIDA RIVER IMPROVEMENT.

REMARKS.	Oneida Lake canal.	Oneida River improvement.
Construction authorized .....	March 22, 1832 .....	April 29, 1839.
Estimated cost at engineer's prices ..	\$40,000 .....	\$100,049.
Construction completed .....	1836 .....	1850.
Cost of construction .....	\$78,829 .....	\$79,346.
Purchased of company by State .....	May 11, 1840 .....	For \$50,000.
Enlargement of locks authorized .....	Chapter 46, Laws of 1860 .....	
Number and size of new locks .....	7, 110 x 18 .....	2, 120 x 30½.
Size of prism .....	40 x 26 x 4 .....	80 x 60 x 4½.
Length .....	7 miles .....	20 miles.
Feet of lockage .....	60¼ feet .....	No. 1, 3 feet; No. 2, 3¼ feet.

## LOCKS.

PRESENT OLD LOCKS.						ENLARGED LOCKS AUTHORIZED.					
No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.
1....	7½	4....	10	6....	7¼	1....	8½	4....	10½	6....	8
2....	8½	5....	9¼	7....	6 1-12	2....	8½	5....	9½	7....	7½
3....	9					3....	8				

## OSWEGO CANAL.

Total cost, \$3,077,429.

REMARKS.	Oswego canal.	Enlarged Oswego canal.
Construction authorized .....	April 20, 1825 .....	April 15, 1854.
Enlargement of locks .....		Chapter 262, Laws of 1847.
Estimated cost at engineer's prices ..	\$227,000 .....	\$1,926,336.
Estimated cost at contract prices ..	\$437,000 .....	\$2,051,190.
Construction completed .....	December 10, 1828 .....	September, 1862.
Cost of construction .....	\$565,437 .....	\$2,925,513.
Number of locks, and size .....	18, 90 x 15 .....	17, 110 x 18.
Feet of lockage .....	154 85 feet .....	154 85 feet.
Average cost of one lock .....	\$10,000 .....	\$31,000.
Size of prism of canal .....	40 and 26 x 4 .....	70 and 36 x 7 feet.
Guard locks .....	Six .....	Five.
Burthen of boats .....	50 to 75 tons .....	230 tons.
Length of canal .....	38 miles .....	38 miles.

## LOCKS.

No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.
1....	11	4 }	9.68	8.....	11¼	12....	11¼	16 .....	8½
2....	11	5 }		9.....	7¼	13....	5.65	17.....	10½
3....	10½	6.....	7	10.....	9	14....	9½	18.....	9½
		7.....	5.866	11.....	11½	15....	5½		



## CAYUGA AND SENECA CANAL — CAYUGA INLET.

Total cost, \$1,520,542.

REMARKS.	Cayuga and Seneca canal.	Cayuga inlet.
Construction authorized, enlargement of locks.....	April 20, 1825 .....	May 25, 1836.
Enlargement of prism.....	.....	April 15, 1854.
Estimated cost at engineer's prices..	\$811, 188 .....	\$150, 000.
Estimated cost at contract prices ..	\$795, 273 .....	\$160, 396.
Canal completed .....	November 15, 1828 .....	September, 1862.
Cost of construction.....	\$1, 306, 542 .....	\$214, 000.
Number of locks, and size.....	11, 110 x 18 .....	1, 110 x 18.
Feet of lockage.....	83½ feet.....	.....
Length and size of prism.. .....	.....	24¾ miles, 70 and 56 x 7.

## LOCKS.

No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.
1.....	7.28	4.....	9	6.....	9.60	8.....	5.70	10.....	10
2.....	7	5.....	9	7.....	6	9.....	10	11.....	8
3.....	10								

## CROOKED LAKE CANAL.

Construction authorized .....	April 11, 1829.
Construction commenced .....	April, 1830.
Estimated cost at engineer's prices .....	\$119, 198.
Estimated cost at contract prices .....	\$95, 820.
Canal completed .....	October 10, 1833.
Cost of construction .....	\$333, 237.
Number of locks, 27; size .....	90 x 15 feet.
Size of canal prism .....	42 and 26 x 4.
Length of canal .....	8 miles.
All the locks are composite.	
Feet of lockage .....	277 83-100 feet.

## LOCKS.

No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.
1.....	10.82	7.....	10.16	13.....	9.41	19.....	10.18	25.....	10.15
2.....	10.19	8.....	10.28	14.....	9.86	20.....	9.68	26.....	10.58
3.....	10.21	9.....	10.30	15.....	10	21.....	10.08	27.....	10.43
4.....	10.26	10.....	9.49	16.....	10.29	22.....	10.31		*4.59
5.....	10.08	11.....	9.87	17.....	9.94	23.....	10.67		
6.....	10.14	12.....	9.63	18.....	9.72	24.....	10.37	Total ..	277.89

## CHEMUNG CANAL AND FEEDER.

Construction authorized.....	April 15, 1829.
Estimated cost, engineer's prices .....	\$331, 225.
Estimated cost, contractors' prices .....	\$291, 831.
Construction completed .....	September, 1831.
Cost of construction, 1831 .....	\$314, 395.
Cost of construction, 1862 .....	\$1, 273, 261.
Length and size main canal .....	23 miles; 42 x 28 x 5 feet.
Length and size of feeder .....	16 miles; 41 x 26 x 4 feet.
Number and size of locks on canal .....	49 locks; 90 x 15 feet.
Number and size of locks on feeder .....	4 locks; 90 x 15 feet.
Kind of locks .....	Wood.
Cost of each first set.....	\$1,650; age of lock .....
Cost of each second set.....	5,500; age of lock .....
Cost of each third set.....	8,484; completed .....
	September 9, 1863.

\* Guard lock over L. M. sill, December 20, 1858.

## LOCKS.

No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.
1.....	10.1	11.....	9.11	21.....	10	31.....	10 3¼	41.....	10.6
2.....	10.6	12.....	10	22.....	10.3	32.....	9.10	42.....	9.5
3.....	10.7	13.....	9.11	23.....	9.7	33.....	10	43.....	10.2
4.....	10.7	14.....	10	24.....	10.4	34.....	10	44.....	10.3
5.....	10.3	15.....	10	25.....	10.2	35.....	10	45.....	9.5
6.....	10.3	16.....	10	26.....	9	36.....	10.1	46.....	9.1
7.....	10.5	17.....	10.1	27.....	10.9	37.....	10	47.....	8 10
8.....	9.4	18.....	10.3	28.....	10.3	38.....	10	48.....	7.3
9.....	10.3	19.....	10.3	29.....	9.8	39.....	10.1	49.....	13.3
10.....	10.3	20.....	9.7	30.....	10.2	40.....	10		

## CHENANGO CANAL.

Construction authorized.....	February 23, 1833.
Construction commenced.....	July, 1834.
Construction, estimated at engineer's prices.....	\$1,960,450.
Construction, estimated at contractors' prices.....	\$1,859,849.
Construction completed.....	October, 1836.
Construction, actual cost.....	\$2,782,124.
Number and size of locks.....	116 locks; 90 x 15 feet.
Size of prism.....	40 and 28 x 4.
Kind of locks.....	Rubble stone.
Average cost of one lock.....	\$8,000.
Length of main line of canal.....	97 miles.
Feet of lockage.....	1,015¼.
Barthen of boats.....	50 to 70 tons.

## LOCKS.

No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.
1.....	5	25.....	9	48.....	9	71.....	9	94.....	8
2.....	6	26.....	9	49.....	10	72.....	9	95.....	8
3.....	8	27.....	10	50.....	10	73.....	9	96.....	8
4.....	8	28.....	10	51.....	10	74.....	9	97.....	8
5.....	10	29.....	10	52.....	10	75.....	9	98.....	6
6.....	10	30.....	10	53.....	10	76.....	10	99.....	10
7.....	10	31.....	10	54.....	10	77.....	6	100.....	10
8.....	9	32.....	10	55.....	10	78.....	5	101.....	10
9.....	9	33.....	10	56.....	10	79.....	5	102.....	6
10.....	8	34.....	10	57.....	10	80.....	8	103.....	10
11.....	8¼	35.....	10	58.....	10	81.....	8	104.....	10
12.....	8.4	36.....	10	59.....	10	82.....	9	105.....	7
13.....	8.4	37.....	10	60.....	10	83.....	9	106.....	6
14.....	8.4	38.....	10	61.....	10	84.....	8	107.....	10
15.....	8.4	39.....	9	62.....	10	85.....	6	108.....	7
16.....	7	40.....	9	63.....	10	86.....	10.3	109.....	6
17.....	7	41.....	9	64.....	10	87.....	10	110.....	9
18.....	8	42.....	9	65.....	10	88.....	10.6	111.....	12
19.....	10	43.....	9	66.....	10	89.....	7	112.....	7
20.....	10	44.....	9	67.....	9.3	90.....	8	113.....	9.8
21.....	9.6	45.....	9	68.....	9.3	91.....	8	114.....	13
22.....	9	46.....	9	69.....	9.3	92.....	8	115.....	
23.....	9	47.....	9	70.....	9	93.....	6	116.....	
24.....	9								

## GENESEE VALLEY CANAL AND DANSVILLE BRANCH.

Construction authorized.....	May 6, 1826.
Estimated cost at engineer's prices.....	\$2,002,285.
Estimated cost at contract prices.....	\$4,900,122.
Completed to Dansville.....	November 1, 1842.
Completed to Olean.....	November, 1856.
Completed to Mill Grove pond.....	December, 1861.
Total cost of canal and reservoirs.....	\$5,827,813.
Length of canal and side cut.....	124½ miles.
Size of prism of same.....	42, 26 x 4 feet.
Barthen of boats.....	50 to 55 tons.
28 stone locks, cost each.....	\$10,000.
73 composite locks, cost each.....	\$8,000.
11 wood locks, cost each.....	\$5,000.
Total number and size of locks.....	112 locks 90 x 15 feet.

## LOCKS.

No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.	No.	Lift.
1.....	14.6	24.....	9	47.....	10	70.....	7.9	93.....	8
2.....	6	25.....	10	48.....	10	71.....	11	94.....	8
3.....	10	26.....	10	49.....	10	72.....	8	95.....	9
4.....	10	27.....	11	50.....	12	73.....	8	96.....	10
5.....	10	28.....	8	51.....	12	74.....	9	97.....	10
6.....	7	29.....	12	52.....	12	75.....	9	98.....	11
7.....	6.1¾	30.....	10	53.....	12	76.....	10	99.....	11
8.....	7	31.....	10	54.....	12	77.....	10	100.....	10
9.....	11.6	32.....	10	55.....	12	78.....	10	101.....	8.9
10.....	11.6	33.....	10	56.....	12	79.....	10	102.....	8
11.....	11	34.....	10	57.....	12	80.....	8	103.....	9
12.....	10	35.....	10	58.....	12	81.....	10	104.....	9
13.....	11	36.....	10	59.....	12	82.....	11	105.....	9
14.....	11	37.....	8	60.....	12	83.....	11	106.....	11
15.....	11	38.....	10	61.....	8	84.....	11	Dansville Branch. <div><div>1.....</div><div>2.....</div><div>3.....</div><div>4.....</div><div>5.....</div><div>6.....</div><div>7.....</div><div>8.....</div></div>	
16.....	11	39.....	11	62.....	12	85.....	11		
17.....	11	40.....	11	63.....	6	86.....	11		
18.....	10	41.....	11	64.....	12	87.....	11		
19.....	8	42.....	10.9	65.....	9	88.....	11	82.6	
20.....	11	43.....	10	66.....	9	89.....	11		
21.....	10	44.....	10.6	67.....	9	90.....	11		
22.....	10	45.....	9	68.....	10	91.....	8		
23.....	11	46.....	10	69.....	10	92.....	8		

*TABLE showing the amount of tolls received annually on all the New York State canals up to September 30, 1864, also annual cost of repairs to same date.*

YEAR.	Tolls.	Cost of repairs.
1831.....	\$2,200 00	.....
1832.....	44,486 72	.....
1833.....	119,988 08	.....
1834.....	289,320 58	.....
1835.....	521,343 94	.....
1836.....	844,508 02	\$134,652 51
1837.....	880,450 09	284,654 16
1838.....	829,535 10	294,227 25
1839.....	815,239 58	255,729 55
1840.....	1,042,699 24	228,850 06
1841.....	743,561 29	168,715 53
1842.....	1,112,194 74	350,426 89
1843.....	1,388,055 53	377,783 40
1844.....	1,381,951 52	471,106 90
1845.....	1,482,963 11	441,367 54
1846.....	1,595,619 43	392,444 22
1847.....	1,324,429 27	486,412 41
1848.....	1,464,105 16	476,935 23
1849.....	1,653,007 56	381,903 15
1850.....	1,602,059 10	389,247 94
1851.....	1,987,807 85	330,365 56
1852.....	1,795,484 80	432,105 71
1853.....	1,952,587 83	378,618 45
1854.....	2,386,277 34	444,344 98
1855.....	2,374,007 56	526,001 30
1856.....	2,788,134 76	509,510 96
1857.....	3,460,975 92	493,157 16
1858.....	3,153,614 24	627,792 91
1859.....	3,371,784 27	528,371 38
1860.....	3,390,476 63	560,845 62
1861.....	2,702,070 34	682,598 82
1862.....	3,173,222 49	809,451 99
1863.....	3,161,425 14	778,847 57
1864.....	2,980,189 97	969,398 43
1865.....	2,691,491 11	805,654 64
1866.....	2,719,925 63	606,932 28
1867.....	2,529,865 83	762,042 99
1868.....	2,045,442 68	890,941 91
1869.....	1,812,280 80	629,000 51
1870.....	2,379,534 04	378,285 89
1871.....	3,353,168 97	367,606 84
1872.....	4,790,518 09	428,088 62
1873.....	5,025,431 32	520,970 99
1874.....	4,308,781 20	812,812 96
1875.....	3,516,948 63	1,595,671 85
	\$93,943,119 60	\$21,035,517 75



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**T A B L E S**

**OF THE PRINCIPAL PLACES ON THE CANALS, AND  
THEIR DISTANCE FROM EACH OTHER.**

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*A LIST of the principal places on the Canals, and their distance from each other, as adopted by the Canal Board.*

ERIE CANAL.

NAMES OF PLACES.	Distances.														
	Albany.	West Troy.	Schenectady.	Fultonville.	Little Falls.	Utica.	Rome.	Syracuse.	Jordan.	Montezuma.	Lytone.	Palmyra.	Rochester.	Brockport.	Albion.
Adams' Basin.....	274	207	214	218	187	164	149	108	89	75	57	42	19	19	19
Albany.....	.....	7	30	56	87	110	125	166	105	109	217	232	250	279	293
Albion.....	293	296	263	237	206	183	168	127	108	94	76	61	34	14	293
Aurusesville.....	53	46	23	3	34	57	72	113	132	146	164	179	206	226	240
Belle Isle.....	172	165	142	116	85	62	47	6	13	27	45	70	87	107	121
Black Rock.....	849	843	819	293	262	239	224	183	150	141	132	117	107	90	56
Bolivar.....	152	145	122	96	65	42	27	14	37	57	65	80	107	127	141
Brighton.....	256	249	226	200	169	146	131	90	71	57	47	39	21	14	5
Brockport.....	279	272	249	223	192	169	154	113	94	80	62	47	29	10	5
Brockville.....	288	281	258	232	201	178	163	122	103	89	71	56	37	10	5
Buckways.....	269	262	239	213	182	159	144	103	84	70	52	37	23	9	5
Buckville.....	352	345	322	296	265	242	227	186	167	153	135	120	93	73	59
Buffalo.....	248	241	218	192	161	138	123	82	63	49	31	16	11	31	45
Bushnell's Basin.....	175	168	145	119	88	65	50	9	10	24	42	67	84	104	118
Canajoharie.....	108	61	38	12	19	42	57	98	117	131	149	164	191	211	225
Canastota.....	145	138	115	89	58	35	20	21	40	54	72	87	114	134	148
Canaseraga Landing.....	150	143	130	94	63	40	25	16	35	49	67	82	109	129	143
Canton.....	180	173	150	124	93	70	55	14	5	19	37	52	79	99	113
Carterville.....	250	243	220	194	163	140	125	84	65	51	33	18	9	29	43
Centrepot.....	192	185	162	130	105	82	67	26	7	7	25	40	67	87	101
Chittenango.....	151	144	121	95	64	41	26	15	34	48	66	81	108	128	142
Clyde.....	210	203	180	154	123	100	85	44	25	11	206	221	243	268	282
Cold Spring.....	186	179	156	130	99	76	61	20	1	13	31	46	73	93	107
Cooley's Basin.....	277	270	247	221	190	167	152	111	92	78	60	45	18	2	16
Crescent.....	14	7	16	42	73	96	141	132	171	185	203	218	245	265	279
Durhamville.....	138	129	106	80	49	26	11	30	40	63	81	96	123	143	157
Durhamville.....	140	133	110	84	53	30	15	26	45	59	77	92	119	139	153
Ensign Harbor.....	296	289	266	240	209	186	171	130	111	97	79	64	37	17	3
East Cananda Creek.....	220	213	190	164	133	110	95	54	35	21	3	12	39	59	73
East Cananda Creek.....	82	75	52	26	5	28	43	84	103	117	135	154	177	197	211
Fairport.....	244	237	214	188	157	134	119	78	59	45	27	12	15	35	49
Fort Plain.....	71	64	41	15	16	39	54	95	114	128	146	161	186	208	222
Frankfort.....	101	94	71	45	14	39	54	95	114	128	146	161	186	208	222
Frankfort.....	245	239	216	189	158	135	120	79	60	46	28	13	14	34	48
Fultonville.....	66	49	26	15	81	54	69	110	129	149	161	176	203	223	237
Fergusons.....	106	99	76	50	19	4	19	60	79	93	111	136	153	173	187
Lower B. Rock.....	74	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tomawanda.....	66	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lockport.....	47	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Medina.....	29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Albion.....	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brockport.....	9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rochester.....	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Palmyra.....	42	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Buffalo.....	76	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Galne's Basin	285	388	265	239	206	185	170	159	110	96	79	63	35	16	2	8	26	15	53	57
Gasport	315	308	285	259	228	205	190	149	130	116	98	83	56	36	22	12	6	25	83	87
Geddes	168	161	138	112	81	58	143	1	17	31	49	64	91	111	125	135	153	172	180	184
Greece (six-mile grocery)	266	259	236	210	179	156	141	100	81	67	49	84	7	13	27	37	55	74	82	86
Higginsville	135	128	105	79	48	25	10	31	50	64	82	97	124	144	158	168	186	205	213	217
Hindsburgh	289	282	259	233	202	179	164	133	104	90	72	57	30	10	4	14	32	51	59	63
Hoffman's Ferry	40	33	20	16	47	70	85	126	145	159	177	192	219	239	253	263	281	300	308	313
Holly	284	277	254	228	197	174	159	118	89	65	47	52	25	5	9	19	37	56	64	68
Hulberton	287	280	257	231	200	177	162	131	102	88	70	55	28	8	6	16	34	53	61	65
Ilion	98	91	68	42	11	12	27	68	87	101	119	134	161	181	195	205	223	242	250	254
Jordan	185	178	155	129	98	80	75	60	19	14	32	47	74	94	108	118	136	155	163	167
Junction	7	...	23	49	80	103	118	159	178	192	210	225	252	272	286	296	314	333	341	345
Kirkville	155	146	125	99	68	45	30	11	30	44	62	77	104	124	138	148	166	185	193	197
Knappsville	241	234	211	185	154	131	116	75	56	42	24	9	18	38	53	62	80	99	107	111
Knowlesville	299	292	269	243	212	189	174	133	114	100	82	67	40	20	6	4	22	41	49	53
Leiox	143	136	113	87	56	33	18	23	42	56	74	89	116	136	150	160	178	197	205	209
Limestone Feeder	159	153	129	103	72	49	34	7	26	40	58	73	100	120	134	144	162	181	189	193
Little Falls	214	207	184	158	127	104	89	48	29	15	3	18	45	65	79	89	107	126	134	138
Lock Berlin	87	80	57	31	...	23	33	38	31	127	104	89	48	29	15	3	18	45	65	79
Lockport	321	314	291	265	234	211	196	155	136	122	104	89	62	42	28	18	...	117	125	129
Lockville	223	216	193	167	136	113	96	57	38	24	6	9	36	56	70	80	98	117	125	129
Lock No. 65	253	246	223	197	166	143	128	87	68	54	36	21	6	40	50	60	68	87	95	99
Lodi	165	158	135	109	78	55	37	12	29	46	62	81	94	114	128	138	156	175	183	187
Loomis	127	120	107	81	50	27	10	2	23	48	62	81	94	114	128	138	156	175	183	187
Lower Black Rock	346	341	318	292	261	238	223	182	163	149	131	116	89	69	55	45	27	8	...	4
Lyons	217	210	187	161	130	107	92	61	32	18	...	97	82	55	35	21	11	7	...	8
Mabees	314	307	284	258	227	204	189	148	129	115	97	82	55	35	21	11	7	...	...	...
Macdon	236	229	206	180	149	126	111	70	51	37	19	4	23	43	57	67	85	104	112	116
Manlius	158	151	128	102	71	48	33	8	27	41	59	74	101	121	135	145	163	182	190	194
Martinsville	336	329	306	280	249	226	211	170	151	137	119	104	77	57	43	33	15	4	12	16
Medina	303	296	273	247	216	193	178	137	118	104	86	71	44	24	16	10	37	45	49	43
Middleport	309	302	279	253	222	199	184	143	124	110	92	77	50	30	16	8	22	30	30	34
Millards	318	311	288	262	231	208	193	152	133	119	101	86	59	39	25	15	3	23	27	27
Mindenville	78	71	48	22	9	32	47	83	107	121	139	154	181	201	215	225	245	263	270	274
Mohawk	95	88	65	39	8	15	30	71	90	104	122	137	164	184	198	208	226	245	263	267
Montezuma	199	192	169	143	112	89	74	33	14	...	18	33	60	80	94	104	122	141	149	153
Newark	224	217	194	168	137	114	99	68	50	35	25	8	35	55	69	79	97	116	124	128
New Boston Landing	149	142	119	93	62	39	24	17	36	50	68	83	110	130	144	154	172	191	199	203
New London	131	124	101	75	44	21	6	35	54	68	86	101	128	148	162	172	190	209	217	221
Nine-Mile Creek	174	167	144	118	87	64	49	8	11	25	43	58	85	105	119	129	147	165	174	178
Orangeport	316	309	286	260	229	206	191	150	131	117	99	84	57	37	23	13	5	24	32	36
Oriskany	117	110	87	61	30	7	...	49	68	82	100	115	142	162	176	186	204	223	231	235
Orville Feeder	161	154	131	105	74	51	36	5	24	38	56	71	97	117	132	142	160	179	187	191
Palmira	232	225	202	176	145	122	107	66	47	33	15	...	27	47	61	71	89	108	116	120
Pendleton	328	321	298	272	241	218	203	162	143	129	111	96	69	49	35	25	7	12	15	19
Peru	182	175	152	126	95	72	57	16	3	17	35	50	74	94	108	118	139	158	166	170
Picardville	333	326	303	277	246	218	203	167	148	134	116	101	74	54	40	30	12	7	15	19
Pitt Lock	205	198	176	149	118	85	60	39	20	6	12	27	54	74	88	98	116	135	143	147
Pittsford	251	244	221	195	164	141	126	85	66	45	34	19	10	28	42	52	70	89	97	101
Poole's Brook	147	141	124	98	67	44	29	12	31	45	63	78	8	105	135	149	167	186	194	198
Port Byron	194	187	164	138	107	84	69	28	9	5	23	38	65	85	99	109	127	146	154	158



NAMES OF PLACES.	ALBANY.														
	Albany.	West Troy.	Schenectady.	Fultonville.	Little Falls.	Utica.	Rome.	Syracuse.	Jordan.	Montezuma.	Lyons.	Palmyra.	Rochester.	Brockport.	Albion.
Port Gibson .....	227	230	197	171	140	117	102	61	42	28	10	9	32	52	66
Port Jackson .....	46	39	16	10	41	64	79	120	139	153	171	186	213	233	247
Reynolds's Basin .....	313	306	253	257	226	203	188	147	128	114	96	81	54	34	20
Rochester .....	259	252	229	203	172	149	134	93	74	60	42	27	...	20	10
Rome .....	125	118	95	69	38	15	...	41	60	74	92	107	134	154	168
Schenectady .....	30	23	...	26	57	80	95	136	155	169	187	202	229	249	263
Schoharie Creek .....	51	44	21	5	20	196	181	115	134	148	166	181	208	228	242
Shelby Basin .....	306	299	276	250	219	196	146	105	86	72	54	39	12	8	22
Spencerport .....	271	264	241	215	184	161	146	101	120	134	152	167	194	214	228
Spraker's .....	65	58	35	9	22	45	60	101	109	123	141	156	183	203	217
St. Johnsville .....	76	69	46	20	11	34	49	90	109	123	141	156	183	203	217
Sulphur Springs G. Lock .....	326	319	296	270	239	216	201	160	141	127	108	94	67	47	33
Syracuse .....	166	159	136	110	79	56	41	...	119	133	151	166	193	213	227
Tonawanda .....	340	323	310	284	253	230	215	174	155	141	123	108	81	61	47
Upper Aqueduct .....	26	19	4	20	61	84	99	140	159	173	191	206	233	253	267
Utica .....	110	103	80	54	33	...	15	56	75	89	107	122	149	169	183
Waynesport .....	239	232	209	183	152	129	114	73	54	40	22	7	20	40	54
Weedsport .....	190	183	160	134	103	80	65	34	9	192	210	225	252	272	286
West Troy .....	114	107	84	58	27	4	11	52	71	85	103	118	145	165	179
Whitesboro .....	7	...	23	49	80	103	118	159	178	192	210	225	252	272	286
Yatesville .....	114	107	84	58	27	4	11	52	71	85	103	118	145	165	179
York Mills .....	113	106	83	57	26	3	12	53	72	86	104	119	146	166	180

Medina.	76	66	94	76	94	76	66	94	76	66	94	76	66	94	76
Lockport.	257	247	275	257	247	275	257	247	275	257	247	275	257	247	275
Tonawanda.	294	284	302	294	284	302	294	284	302	294	284	302	294	284	302
Lower B. Rock.	35	30	38	35	30	38	35	30	38	35	30	38	35	30	38
Buffalo.	131	125	135	131	125	135	131	125	135	131	125	135	131	125	135

## CHAMPLAIN CANAL.

NAMES OF PLACES.	DISTANCE FROM		
	Place to place.	Albany.	Whitehall.
Albany .....	0	0	73
West Troy .....	7	7	66
Junction .....	0	7	66
Waterford .....	3	12	51
Mechanicville .....	8	20	52
Stillwater village .....	4	24	46
Bleecker's Basin .....	2	26	4
Wilbur's Basin .....	2	28	45
Van Duzen's Landing .....	5	33	40
Schuylerville .....	3	36	37
Saratoga Bridge .....	2	38	35
Fort Miller .....	3	41	32
Moses Kill .....	3	44	29
Fort Edward .....	5	49	24
Glen's Falls feeder .....	2	51	22
Baker's Basin .....	1	52	21
Smith's Basin .....	5	57	16
Fort Ann .....	4	61	12
Comstock's Landing .....	4	65	
Whitehall .....	8	73	0

GLEN'S FALLS FEEDER — (*Champlain Canal*).

NAMES OF PLACES.	Distance from place to place.
Champlain canal .....	0
Sandy Hill .....	2
Glen's Falls .....	3
Head of the feeder .....	2
Head of the pond .....	5
From Junction to Whitehall .....	64
Length of Glen's Falls feeder .....	12
Length of pond above Troy dam .....	3
Total .....	79

## CHENANGO CANAL.

NAMES OF PLACES.	DISTANCE FROM				
	Place to place.	Utica.	Hamilton.	Oxford.	Binghamton.
Utica .....	0	0	30	60	97
Road leading from New Hartford to Whitesborough .....	3	3	27	57	94
Clinton .....	6	9	21	51	88
Deansville .....	5	14	16	46	83
Oriskany Falls .....	5	19	11	41	78
Solesville .....	3	22	8	38	75
Bouckville .....	2	24	6	36	73
Peck's Basin .....	2	26	4	34	71
Hamilton .....	4	30	0	30	67
Lebanon Factory .....	2	32	2	28	65
Earlville .....	4	36	6	24	61
Sherburne .....	5	41	11	19	56
North Norwich .....	4	45	15	15	52
Plasterville .....	2	47	17	13	50
Norwich .....	4	51	21	9	46
Oxford .....	9	60	30	0	37
Haynes' Mill .....	10	70	40	10	27
Greene .....	4	74	44	12	23
Forks .....	8	82	52	22	15
Pond Brook .....	2	84	54	24	13
Port Crane .....	5	89	59	29	8
Crocker's Mills .....	1	90	60	30	7
Binghamton .....	7	97	67	37	0

## OSWEGO CANAL.

NAMES OF PLACES.	DISTANCE FROM		
	Place to place.	Syracuse.	Oswego.
Syracuse .....	0	0	33
Salina .....	2	2	36
Liverpool .....	3	5	33
Mud Lock .....	2	7	31
Cold Spring .....	1	8	30
New Bridge .....	5	13	25
Three-River Point .....	2	15	23
Phoenix .....	2	17	21
Sweet's Lock .....	3	20	18
Ox Creek .....	2	23	15
Fulton .....	4	27	11
Braddock's Rapid .....	4	31	7
Tiffany's Landing .....	4	35	8
High Dam .....	1	36	2
Oswego .....	2	38	0

## CAYUGA AND SENECA CANAL.

NAMES OF PLACES.	DISTANCE FROM		
	Place to place.	Montezuma.	Geneva.
Montezuma .....	0	0	21
Seneca River .....	5	5	16
S. Dermont .....	2	7	14
Seneca Falls .....	3	10	11
Chamberlain's Mills .....	2	12	9
Waterloo .....	2	14	7
Teal's .....	5	19	2
Geneva .....	2	21	0
Lateral canal to East Cayuga village, 2 miles .....	2		

## CHEMUNG CANAL.

NAMES OF PLACES.	DISTANCE FROM			
	Place to place.	Seneca Lake.	Elmira.	Knoxville.
Seneca Lake .....	0	0	23	33
Havana .....	4	4	19	29
Millport .....	6	10	13	23
Horseheads .....	7	17	6	16
Elmira .....	6	23	0	22
Knoxville .....	22	33	22	0
FEEDER ( <i>Chemung canal</i> ).				
Horseheads .....	0	17	6	16
Miller's Basin .....	7	24	13	9
Dam at head of feeder .....	7	31	20	2
Knoxville .....	2	33	22	0

## CROOKED LAKE CANAL.

NAMES OF PLACES.	DISTANCE FROM		
	Place to place.	Seneca Lake.	Crook'd Lake.
Dresden .....	0	0	8
Mallory's .....	0	3	5
Andrews' and Way's .....	2	5	3
Penn Yan .....	2	7	1
Crooked Lake .....	1	8	0

## GENESEE VALLEY CANAL.

NAMES OF PLACES.	Distance from place to place.	DISTANCES FROM								
		Rochester.	Scottsville.	Mount Morris.	Nunda.	Portageville.	Oranet.	Cuba.	Olean.	Dansville.
Rochester .....	0	0	12	37	51	59	78	93	107	52
Rapids (Lock No. 1) .....	2	2	10	35	49	57	76	91	105	50
Tone's Basin .....	6	8	4	29	43	51	70	85	99	44
Scottsville .....	4	12	0	25	39	47	66	81	95	40
Canawangus (Avon road) .....	2	20	8	17	31	39	58	73	87	32
Sackett's Basin .....	2	22	10	15	29	37	56	71	85	30
Fowlerville Road .....	2	24	12	13	27	35	54	69	83	28
Barclay's Mill .....	2	26	14	11	25	33	52	67	81	26
Tiffardville .....	3	29	17	8	22	30	49	64	78	23
Spencer's Basin .....	1	30	18	7	21	29	48	63	77	22
Tracy's Basin .....	2	32	20	5	19	27	46	61	75	20
Cuylerville .....	1	33	21	4	18	26	45	60	74	19
Leicester (Moscow Landing) .....	1	34	22	3	17	25	44	59	73	18
Genesee River dam .....	2	36	24	1	15	23	42	57	71	16
Mount Morris .....	1	37	25	0	14	22	41	56	70	15
Shaker Settlement .....	4	41	29	4	10	18	37	52	66	16
Brushville .....	5	46	34	9	5	13	32	47	61	16
Nunda .....	5	51	39	14	0	8	27	42	56	21
Messenger's Hollow .....	2	53	41	16	2	10	25	40	54	23
Genesee Falls (Tunnel Section) .....	4	57	45	20	6	14	21	36	50	27
Portageville .....	2	59	47	22	8	0	19	34	48	29
Lock No. 61 .....	5	64	52	27	13	5	14	29	43	34
Mixville Landing (Wisoy feeder) .....	1	65	53	28	14	6	13	28	42	35
Fillmore .....	4	69	57	32	18	10	9	24	38	39
Burrville .....	6	75	63	38	24	16	3	18	32	45
Cananda Centre .....	1	76	64	39	25	17	2	17	31	46
Oranet .....	2	78	66	41	27	19	0	15	29	48
Belfast .....	2	80	68	43	29	21	2	13	27	50
Rockville .....	3	83	71	46	32	24	5	10	24	53
Caseville .....	1	84	72	47	33	25	6	9	23	54
Black Creek Corners .....	4	88	76	51	37	29	10	5	19	58
Cuba .....	5	93	81	56	42	34	15	0	14	63
Ischna Feeder .....	6	99	87	62	48	40	21	6	8	69
Hinsdale .....	1	100	88	63	49	41	22	7	7	70
Olean .....	7	107	95	70	56	48	29	14	0	77
DANSVILLE BRANCH.										
Shaker Settlement .....	0	41	29	4	10	18	37	52	66	11
Fitzhugh's Basin .....	2	43	31	6	12	20	39	54	68	9
Kyserville .....	1	44	32	7	13	21	40	55	69	8
Rock Spring .....	2	46	34	9	15	23	42	57	71	6
Sherwood's Landing .....	1	47	35	10	16	24	43	58	72	5
Steam Saw Mill .....	1	48	36	11	17	25	44	59	73	4
McNair's Landing .....	1	49	37	12	18	26	45	60	74	3
Woodville .....	1	50	38	13	19	27	46	61	75	2
Cummins ville .....	1	51	39	14	20	28	47	62	76	1
Dansville .....	1	52	40	15	21	29	48	63	77	0

DANSVILLE SIDE CUT — (*Genesee Valley Canal*).

NAMES OF PLACES.	Distance from place to place.
Shaker Settlement (Junction).....	0
Fitzhugh's Basin.....	2
Kyserville .....	1
Rockspring .....	2
Sherwood's Landing .....	1
Steam Saw Mill .....	1
McNair's Landing .....	1
Woodville.....	1
Cumminsville .....	1
Dansville .....	1

## ONEIDA LAKE CANAL AND FEEDER.

Extends from the Erie canal at Higgins, four miles west of New London, to the Oneida lake, as follows:

Canal proper, from Higgins to Wood Creek.....  $3\frac{1}{4}$  miles.  
 Wood Creek, with a towing-path to the Oneida Lake .....  $2\frac{1}{4}$  miles.

## BLACK RIVER CANAL.

NAMES OF PLACES.	DISTANCE FROM		
	Place to place.	Rome.	Boonville.
Rome .....	0	0	25
Ridge Mills.....	2	2	23
Lock No. 7.....	3	5	20
Walworth's Store House.....	1	6	19
Westernville .....	3	9	16
Wells Brook Aqueduct .....	2	11	14
Stringer's Creek .....	2	13	12
Lansing Kill.....	1	14	11
Lock No. 81.....	2	16	9
Lansing Kill dam or feeder.....	1	17	8
Lower Falls, Lansing kill .....	2	19	6
Upper Falls, Lansing kill .....	2	21	4
Lock No. 70.....	2	23	2
Boonville.....	2	25	0
Sugar River.....	3	28	3
Little Falls, Black river .....	1	29	4
Port Leyden.....	3	32	7
Lock No. 97.....	1	33	8
Lyon's Falls .....	2	35	10
Hawkinsville, on feeder (3 miles from Boonville)...	0	28	3
A. Lee's, on feeder .....	2	30	5
R. B. Miller's, on feeder .....	1	31	6
State Dam, on feeder .....	4	35	10
Head of reservoir .....	2	37	12

## ONEIDA RIVER IMPROVEMENT.

NAMES OF PLACES.	Distance from place to place.
Three-River Point .....	0
Peter Scott Creek.....	4
Oak Orchard .....	4
Caughdenoy .....	7
Brewerton .....	5

## GENERAL SUMMARY.

Erie canal.....	352	
Albany basin.....	1	
feeders .....	8	
	—	361 miles.
Champlain canal.....	66	
Glen's Falls feeder.....	12	
Pond above Troy dam.....	3	
	—	81 miles.
Chenango canal.....		97 miles.
Black River canal.....	35	
feeder and reservoir.....	12	
River improvement.....	42	
	—	89 miles.
Oneida Lake canal and feeder.....		7 miles.
Oswego canal.....	38	
Baldwinsville side cut.....	1	
Oneida River improvement.....	20	
Seneca River towing-path.....	5½	
Seneca River improvement.....	12½	
	—	77 miles.
Cayuga and Seneca canal.....	23	
Crooked Lake canal.....		8 miles.
Chemung canal.....	23	
feeder .....	16	
	—	89 miles.
Genesee Valley canal.....	107	
Dansville side cut.....	11	
	—	118 miles.
Total .....		<u>900 miles.</u>



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